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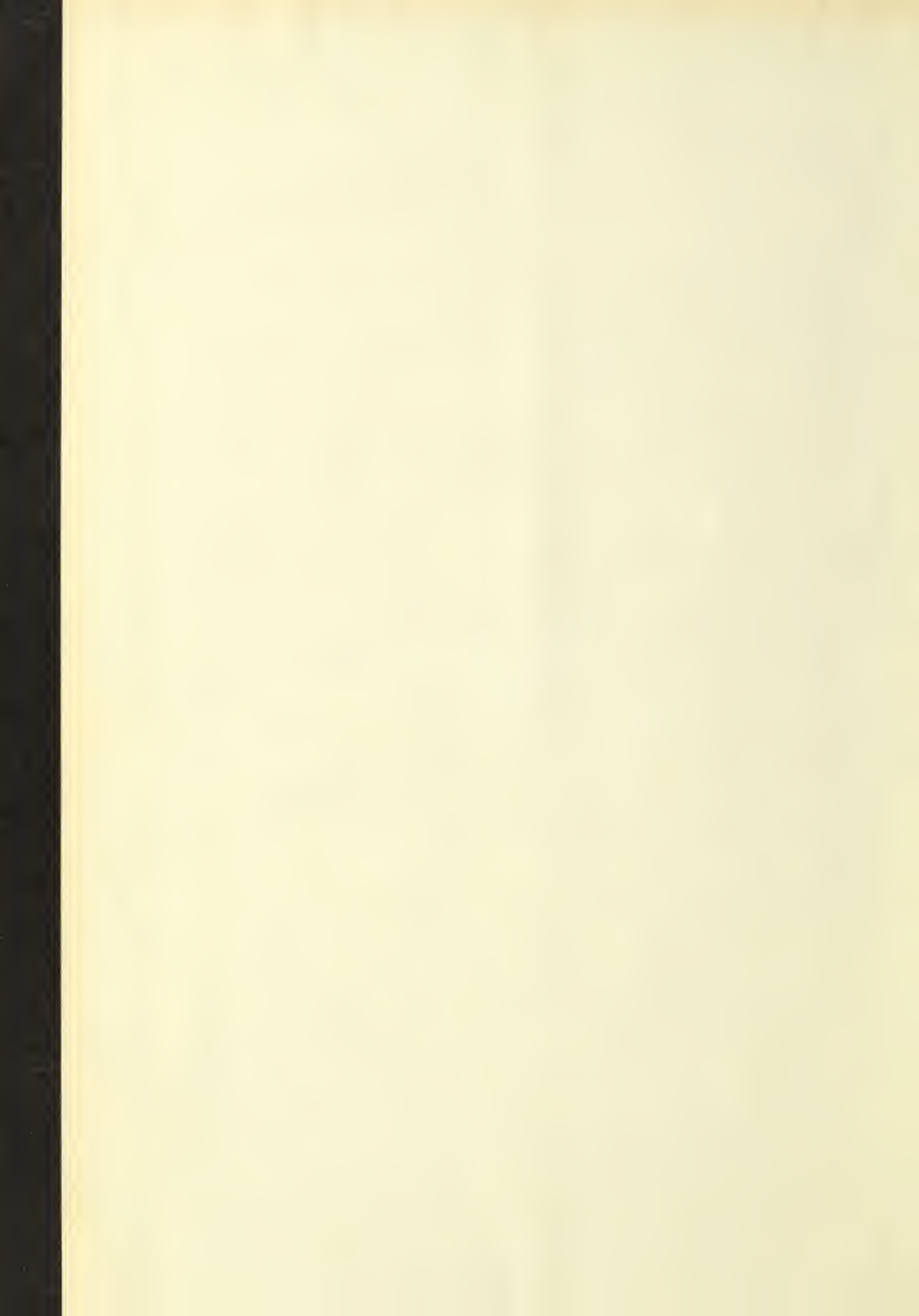


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NO. 1

Technique and Interpretation of Lower Extremity Venograms*

EARL R. MILLER, M.D.†

THE history of venography started with the introduction of satisfactory media for intravenous pyclograms. Its story has evolved with the study of normal and abnormal veins, the former usually during the course of taking intravenous pyclograms and the latter during study of disease of the veins themselves, or in an attempt to determine the site of origin of pulmonary emboli. The ease with which films of filled veins can be obtained has led many people to try the method. Disappointment with the results, difficulty in interpretation and skepticism about the value of the whole procedure have led many to give it up.

INDICATIONS AND CONTRAINDICATIONS

The indication for the study of the normal venogram is clear. It is to teach the examiner the method, and above all its difficulties and pitfalls. This is to be recommended.

The indications for venography in patients with suspected thrombosis were most reasonably presented by Bauer who stated first that these should not be done at random. He felt that unexplained rise in fever or pulse rate, unmotivated restlessness, any sign of pulmonary infarction, or any sign however transient of a pathologic condition in the legs, were indications sufficient for venographic study. He points out that absence of filling of the vessels is presumptive evidence of thrombosis, whereas normal filling of the vessels rules it out. The fact that the method is excellent for ruling out large thromboses is important, since it may make the indications for the proper management of the patient clear. It must be re-

membered, however, that small clots may escape recognition early.

The indication for venography in patients with clinical evidence of chronic disease or block of the veins arises when there is a need for definitive treatment for the condition. The demonstration of the point or points of block or extent of disease of the veins and the understanding of the mechanism of venous drainage of an involved leg is of real importance in deciding the proper clinical or surgical management of the patient.

Contraindication to venography is sensitivity of the patient to the material to be used for the study. This can be overcome by use of a different medium. There is fair agreement that the danger of dislodging a clot is so small because of the slow injection of the opaque material, that it constitutes no contraindication. Serious clinical condition of the patient may constitute a contraindication to the movement of the patient for the examination.

OPAQUE MATERIAL

Thirty-five per cent diodrast is probably most widely used. We have preferred to use 70 per cent diodrast because of its greater density and consequent better visualization of the veins. If there is a contraindication to the use of diodrast because of the general condition of the patient, or because of sensitivity to the drug, thorotrast may be used.

TESTING FOR SENSITIVITY

The intravenous test is used at the University of California. We have found the intra-oral and intracutaneous tests unreliable. The intra-ocular test has not been studied sufficiently to allow an authoritative statement to be made about it. One-tenth of a cubic centimeter of 35 per cent diodrast is injected intravenously. Urticaria, any sign of pulmonary edema, or any other untoward sign is

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observed. If none makes its appearance, during a two-minute wait (by the clock!) one-half cubic centimeter is injected. Further signs of sensitivity are watched for. If they appear, they are treated with adrenalin and oxygen. If none appear, the test is considered negative and the examination may proceed.

No tests for sensitivity to thorocontrast are employed.

TECHNIQUE

The most complete visualization of the veins of an extremity can be obtained by the rapid intra-arterial injection of a sufficient quantity of a dense medium. This is best accomplished in the lower extremity by surgical exposure of the femoral artery, rapid injection of 25 to 35 cc. of 70 per cent diodrast, followed by taking a stereoscopic series of films of the lower extremity on 14 x 36 inch cassettes over a period of about two minutes. The artery above the point of injection should be compressed until the injection is complete. In reality this has been done only occasionally, because intravenous injection by direct puncture seems so much simpler that the arterial exposure has not seemed worth the effort even though errors may be introduced by the use of the venous route of injection.

Stereoscopic fluorographic movies would undoubtedly be the best way of taking the films. This waits for the future.

At the University of California Hospital, the usual method of doing the examination consists of having needles placed symmetrically in the veins of each foot while the patient is on the ward. Usually a vein on the dorsum is cannulated by direct puncture. The lumen is kept open by having saline drip through the needles slowly. A blood pressure cuff is placed around each ankle. The patient is brought to the Division of Radiology and placed supine on an x-ray table. A 14 x 17 inch film tunnel is placed beneath the leg and another beneath the thigh. Stationary grids are fastened to the surface of each tunnel. The tube is used at a 63-inch distance. A rectangular lead diaphragm is used on the tube so that the beam just covers the films. In the cassettes used under the legs, a piece of black paper covers one of the screens. A preliminary exposure is made, using factors which will adequately show the thigh and hip. When these films have been checked for technique, the blood pressure cuffs are inflated to 20 mm. Hg. pressure and 20 cc. of 70 per cent diodrast is injected through each needle at the same rate. The time for injection is about one minute. The first films are taken at one-half minute, after the start of the injection; the tube is shifted sideways 6 inches; a second pair of films is taken at one minute; the tube is shifted back to its original position and a third pair of films is taken at about one and one-half minutes. If there is clinical reason to suppose the circulation is very slow, a fourth pair may be taken after perhaps another half minute.

DANGERS

The dangers of using diodrast have been discussed at length by Pendergrass. Homans and others have mentioned thrombosis of vessels following the use of the material. We have observed thromboses of veins in two cases. Extravascular injection is painful but not dangerous. We have had no serious reactions. The heat and flushing common to all patients receiving the injection is transient and requires no treatment. Adrenalin and oxygen are always at hand to be used even in minor reactions.

INTERPRETATION

Interpretation is beset by the greatest difficulties. Lack of critical observation, lack of a truly adequate technique, and lack of sufficient experience with the normal variations of the pattern of vessels and, particularly, variations in the time and extent of filling of the veins will lead to erroneous conclusions. Almost every paper on the subject stresses these points and our own early experience bears them out. There are numerous examples in the literature of cases which showed non-filling of the deep vessels on one occasion followed by adequate filling on the second try. Therefore mere absence of filling of a vessel is not to be considered unequivocal evidence of its block. This, of course, limits seriously the usefulness of the procedure. One can frequently be fairly sure about the diagnosis of venous block. Determination of the etiology of the block is not always possible.

E. C. Baker of Youngstown, Ohio, has given a classification and a clear analysis of the venous patterns in acute and chronic, deep and superficial venous blocks which we have found most useful and reasonable.

CHRONIC SUPERFICIAL BLOCKS

In acute superficial venous blocks, with the deep veins uninvolved, the deep veins fill above the ankle and fill all the way up the lower extremity. The superficial veins are straight and of even caliber, and above the point of the block will show no filling. This must be seen on multiple films. There will be vessels filled showing connections to deep vessels or other superficial vessels just below the point of the block.

In chronic superficial blocks, the diodrast passes slowly through dilated, tortuous, varicose veins. Enlarged veins, not filled with diodrast, are seen in the soft tissues. The deep circulation is filled.

In acute deep blocks, there is absence of filling of the deep vessels or occasionally partial filling which may actually demonstrate the thrombus. The superficial veins are not tortuous, but are well filled showing frequent anastomoses. This is the type of case where frequent errors are made since non-filling of the deep vessels may be observed when no block is present.

In the case of the chronic deep block, the deep circulation is absent in whole or in part. The superficial veins are dilated with practically all of

them emptying into the internal saphenous vein by the time the knee is reached. Frequent enlarged tortuous communicating branches are seen extending from the saphenous apparently fading into the soft tissues. It is in this type of case that the venogram is probably of the greatest value. Clinically one sees dilated superficial veins and clinical tests may be difficult to interpret or actually misleading. A carefully done venogram studied in the light of the clinical findings in the patient may be of the utmost help in properly handling the patient.

The diagnosis of thrombosis by venography can be almost absolute, when the clot is seen in the vein outlined by the opaque material. Occasionally this finding may be critical in proving the site of origin for emboli.

Venography has a place of real though limited value among medical procedures. It should be used with a full understanding of its difficulties, its use should be limited to cases where the indications are clear, and the results should be critically analyzed in view of clinical condition of the patient.

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HYPOPARATHYROIDISM*

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IMPAIRED parathyroid function may become a major consideration following thyroidectomy. Symptoms of hypoparathyroidism may range from the dramatic acute tetany with epileptiform convulsions, to the more common chronic or latent form often characterized by a variety of psycho-motor and metabolic disturbances. Early recognition and prompt treatment is of the utmost importance, especially in the acute phase of the disease. Fortunately, specific therapy for the disorder has been developed and is available.

INCIDENCE

The incidence of acute hypoparathyroid tetany is low, varying from .2 per cent to 2.0 per cent in the larger thyroid clinics. In our last 1,000 cases, the incidence was .2 per cent. The chronic

or latent form occurs more frequently and may be readily overlooked. A survey of 100 of our thyroid cases operated upon ten years ago, revealed an incidence of about 15 per cent of mild hypoparathyroidism. In our more recent 100 cases, the rate had dropped to 9 per cent. The factors that contribute to a low incidence of hypoparathyroidism are chiefly the technical operative procedures designed at preserving the parathyroid bodies and their blood supply. Among these may be listed the maintenance of a postero-lateral leaf at the time of the thyroidectomy, and minimal suturing of the residual remnant of the gland. Routine ligation of the inferior thyroid artery, which is the main source of the blood supply to the parathyroid glands, may also dangerously impair their activity. Undue trauma, such as occurs frequently in operations for recurrent goiters, may easily damage or completely destroy the parathyroids. About 60 per cent of our patients operated upon for recurrent or residual goiter ultimately developed symptoms

* Chairman's address. Read before the Section on General Surgery at the Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

of latent or mild hypoparathyroidism. In one of these cases, recurring attacks of acute tetany with epileptiform convulsions followed the fifth thyroidectomy.

SYMPTOMS

The most striking clinical feature of hypoparathyroidism is the dramatic symptom complex known as tetany. This may manifest itself usually two or three days after thyroidectomy by the sudden appearance of epileptiform convulsions, muscular rigidity, stridor, and dyspnea. Milder premonitory symptoms usually precede the convulsions by six to twenty-four hours, and the close observer, may serve as a warning of the impending attack. The patient will be wakeful, anxious, and appear unusually quiet. The forehead becomes glazed, and flushing of the face with circumoral palor will be noted. Numbness and tingling of the extremities, together with early signs of carpo-pedal spasm gradually appear. A positive Chvostek sign establishes the diagnosis. In most cases the acute attack is transitory, lasting but a few days or weeks, until the remaining parathyroid glands slowly regain their function. Occasionally the parathyroid damage is extensive and the patient passes into a state of permanent chronic hypoparathyroidism in which acute tetany may appear at varying intervals. Rarely, in an untreated case, death will occur in an acute attack.

Chronic, mild, or latent hypoparathyroidism appears weeks or even months after operation. This more common form may even go unrecognized, especially if the patient disappears from the surgeon's observation. The slow insidious development of symptoms probably is the result of atrophy from impaired blood supply, or the pressure of scar tissue formation that gradually diminishes the glandular function. A great variety of symptoms may appear incident chiefly to the resultant hypocalcemia. Among the more important symptoms will be weakness, fatigue, and loss of energy. Numbness and tingling of the extremities with muscle cramps and stiffness may predominate. At times, the muscle stiffness becomes severe, causing the tissues to assume a board-like firmness with functional incapacitating impairment. Chvostek's and Trousseau's signs remain constant. Less commonly, lenticular cataract, trophic changes, and disturbances of calcium metabolism develop, giving rise to an impressive list of variegated symptoms, often erroneously classified as functional nervous disorders.

TREATMENT

In acute post-thyroidectomy tetany, particularly in the event of sudden epileptiform convulsions, prompt action is imperative. There probably will not be time for serum calcium determinations. In this alarming emergency, specific action can be obtained by injections of parathyroid extract together with calcium salts. The initial dosage of the parathyroid extract should be

1 cc. or 100 units, best given intramuscularly, and an intravenous injection of 10 cc. of 10 per cent calcium gluconate. Thereafter, .5 cc. of the extract should be given once or twice daily until the serum calcium and phosphorus levels approach normal. To attain maximum effect, the hormone injections must be supplemented by calcium and at this time oral administration will suffice. Estimations of the serum calcium level will determine the necessary dosage. For some unknown reason parathyroid extract alone will not produce a normal serum calcium-phosphorus balance. The continuous use of the hormone soon causes a state of tolerance or refractivity with gradually diminishing effect until ultimately the favorable action will be completely lost. This state of refractivity may be due to the development of antibodies in the blood stream or to a local fixation tendency at the site of injection thus preventing absorption. For this reason parathyroid extract cannot be used effectively in the treatment of chronic hypoparathyroidism. Difficulty of administration and economic factors also enter into this problem. In the management of chronic hypoparathyroidism the great majority of patients may be controlled adequately by calcium alone, the dosage varying with the severity of symptoms and the degree of hypocalcemia. There will remain a small group of cases in which calcium is only partially effective. Some benefit may be obtained by diet high in calcium but such diets usually also are high in phosphorus which tends to disturb the desired serum calcium-phosphorus ratio.

Homologous parathyroid transplants have been attempted numerous times but rarely if ever has this procedure been of value. One such patient came to our attention recently in whom parathyroid glands had been transplanted into both pectoral muscles. There was no temporary or permanent improvement in the patient's symptoms.

In these difficult cases where the simpler remedies are ineffective, dihydrotachysterol has almost specific action. This substance, developed in Germany by Holtz was formerly called A.T. 10 but now it is manufactured in this country under the name of Hytakerol. Its specific action in chronic hypoparathyroidism is similar to that of parathyroid extract in acute tetany but it differs from the hormone in several ways. Its action is much slower, requiring two to three days to initiate a rise in the serum calcium level and it does not tend to induce in the patient a gradually increasing tolerance. On the contrary, there is some evidence to show that it has cumulative action. Its slow action makes it unsuitable for emergency use in acute hypoparathyroidism but it has been found to be highly effective in preventing recurring attacks of acute tetany. The correct dosage is most important and this must be worked out in each individual. Over dosage can easily cause a hypercalcemia which may induce a variety of distressing symptoms and even death. The chief side effects of over dosage are weakness, nausea,

and vomiting, diarrhea, headache, vertigo, stuper, polyuria, and ataxia.

The usual initial dose of Hytakerol is 1 cc. to 2 cc. daily supplemented by calcium salts. As the serum calcium level rises, the dose is decreased until a maintenance dose is established. This may vary from .5 cc. daily to .5 cc. or less weekly. One patient in our series states that she requires only one drop of Hytakerol twice a week. After the first day or two, serum calcium determinations will not be necessary and the patient can then be instructed to make his own determinations by the simple Sulkowitch test for calcium in the urine. Even this test can be discarded and the patient gradually learns to adjust his Hytakerol and calcium dosage by subjective symptoms alone. Other sterols such as Vitamin D and D₂ tend to raise the serum calcium level but none gives the satisfactory specific action that can be obtained from Hytakerol.

Many patients who develop postoperative hypoparathyroidism also show evidence of hypothyroidism. In these cases, general improvement results from thyroxin or thyroid extract but it is doubtful if these agents directly or indirectly influence the serum calcium concentration.

In conclusion it should be stated that for rea-

sons of simplicity certain phases of the hypoparathyroid problem have been omitted from this discussion. A consideration of the rare idiopathic hypoparathyroidism, alkalosis tetany, and such factors as the relationship of acute infections or pregnancy to calcium and phosphorus metabolism would tend to confuse the picture, and had best be left in the realm of the internist and the endocrinologist.

A few of the more important practical considerations in connection with hypoparathyroidism will bear emphasis.

1. Impending acute convulsive tetany may be averted by the recognition and treatment of certain warning premonitory symptoms.

2. In the acute attack the specific action of parathyroid extract makes it the most effective therapeutic agent. A tendency to induce tolerance precludes its prolonged use.

3. Symptoms of chronic hypoparathyroidism often may be vague and easily can be overlooked by the casual observer.

4. Hytakerol, while too slow in its action for use in acute tetany, is the ideal remedy in the treatment of chronic hypoparathyroidism.

1930 Wilshire Boulevard.

Use of the Anti-Coagulants, Heparin and Dicumarol*

S. P. LUCIA, M.D., *San Francisco*

IN the young and vigorous person, under normal conditions the blood remains fluid *in vivo*. With advancing age, the tendency for the blood to clot *in vivo* without apparent cause is not an uncommon phenomenon. Under circumstances of trauma, accidental or surgically induced, the tendency for the blood to coagulate is enhanced both *in vivo* and *in vitro*. In the attempt to combat abnormal coagulation of the blood *in vivo*, it is necessary to choose and to employ the proper anticoagulant. The three important questions concerning the problem of thrombosis are:

1. What evidence can be brought to show that an increased tendency to thrombus formation exists?

2. When and under what circumstances will thrombosis occur?

3. Will anti-coagulants prevent the formation of thrombi and will they have any effect on thrombi already formed?

Thrombosis is one manifestation of a diffuse and generalized alteration in the mechanism of the coagulation of the blood. When venous thrombosis occurs, an active program of treatment is necessary in order that further thromboses and possible pulmonary embolism may be prevented. The question naturally arises, will

one ligate the affected vessels, keeping in mind that the tendency to thrombus formation is not a localized condition, or will one use the anti-coagulants? We must remember that ligating a thrombosed vessel does not influence the formation of venous thrombi elsewhere, although it does prevent a pulmonary embolus from originating in the distal part of the ligated vein. On the other hand, when anti-coagulants are used, they do tend to interfere with the formation of freely floating and pedunculated thrombi from which emboli may break off, although they do not dissolve thrombi already formed.

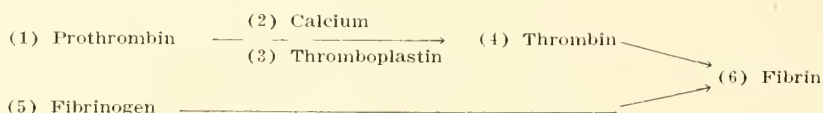
In vivo the fluidity of the blood is maintained by an intact, untraumatized vascular endothelium and the presence of fluidifying agents such as anti-thromboplastin, anti-thrombin, and fibrinolytic. On the other hand, the coagulation of the blood *in vivo* is enhanced by damage to the vascular endothelium, excesses of thromboplastin from traumatized tissue, destroyed leukocytes and disintegrated blood platelets, and from increased quantities of prothrombin, and possibly calcium and fibrinogen. A simplified test for the detection of subjects who may have an increased tendency to intravascular coagulation of the blood has been proposed¹. For this purpose 10 mgm. (1.0 cc.) of heparin are injected intravenously. The coagulation time of the whole blood is determined before injection and at 10, 20, 30 and 40

* Read before the Section on General Medicine, at the Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

minute intervals thereafter. A simple graph of the coagulation time of the whole blood of the subject is compared with curves obtained from a group of normal reactors. By this means a group of subjects was found who appeared to have an increased tolerance to heparin—that is, the standard dose of heparin failed to prolong the whole blood coagulation time as it would have done in the normal subject. This group was designated “hypo-reactors,” and among them were listed: (1) patients in the post-operative state, especially those recovering from surgical operations done on the lower abdomen or around the pelvis and hips; (2) patients suffering from cardiovascular accidents; and (3) patients suffering from Buerger's Disease. Among the “hyper-reactors,” those showing marked sensitivity to heparin, were included patients suffering from hypertension and from manifestations of allergy.

THE COAGULATION MECHANISM

For purposes of graphic presentation, a simplified schema of the coagulation mechanism will show the relationship of the various identified components of the blood and the part they play in the clotting mechanism. The *first phase* of coagulation takes place when prothrombin (a highly labile substance) is converted into thrombin by the action of calcium and thromboplastin. The latter is present in abundance in tissue juices, traumatized tissue, damaged leukocytes, and in disintegrated blood platelets. The *second phase* of coagulation occurs when the recently formed thrombin is converted into fibrin by fibrinogen.



THE ANTI-COAGULANTS

Consonant with the schema for demonstrating the coagulation mechanism, a similar schema can be constructed to show the relationship between the various anticoagulants² and their action upon each element and phase of the coagulation mechanism:

In addition to the agents already indicated, gel-

atin has been found to exert antithrombotic action *in vivo*³. It produces prolongation of the prothrombin time, bleeding time and clotting time. Referring to the chart, since the most vulnerable points in the coagulation mechanism are at (1) prothrombin and (4) thrombin, we can center our attention around substances altering these elements of the mechanism. It will be seen on the schema for anti-coagulants that heparin appears to attack points (1), (3), and (4) of the coagulation mechanism, and dicumarol point (1) alone.

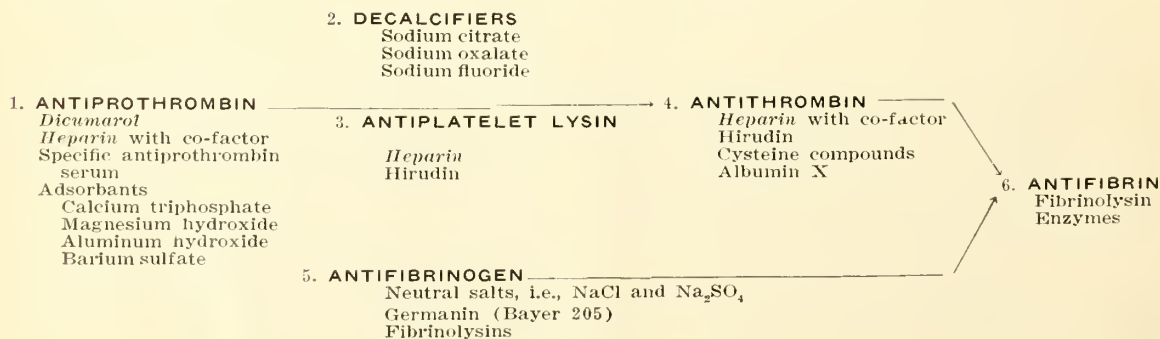
CHOICE OF ANTI-COAGULANT

From inspection of the schema of anti-coagulants, heparin and dicumarol were chosen as the most practical anti-coagulant agents because of their activity in altering the coagulation of the blood at its most vulnerable points. The specifications for an entirely satisfactory anti-coagulant are:

1. An agent having a predictable effect on the coagulation of the blood.
2. It should not have any harmful side effects.
3. Its effects should be rapidly neutralized by a potent antagonistic medication readily available.
4. The agent should be effective by oral administration.
5. One should be able to measure the anti-coagulant effect easily at the bedside.
6. It should not be expensive.

It can be demonstrated that heparin prolongs the coagulation of the blood *in vivo* and *in vitro*, and it is stated that therapeutic doses of dicu-

marol prolong the coagulation of the blood *in vivo* only. However, it can be shown that when the dose of dicumarol is great enough to depress the prothrombin concentration below 10 per cent of normal, alterations in the coagulation of the blood can be demonstrated *in vitro* also. Such dosages of dicumarol are exceedingly dangerous.



The statement has been made without objective proof that the "fluidity of the blood" is enhanced by reducing the prothrombin concentration without altering the whole blood coagulation mechanism! When the prothrombin concentration is depressed below 50 per cent of the normal, the mechanism of whole blood coagulation probably does become altered, but it cannot be demonstrated until the prothrombin concentration reaches dangerously low levels. These complicated technical maneuvers are not easily performed at the bedside without the help of an expert technician. Furthermore, if the prothrombin concentration is depressed below 50 per cent the suspension stability of the erythrocytes is decreased, and no effect is discernible on the clot retraction.^{5,6} On the other hand the capillary fragility is increased when dangerously low levels of prothrombin concentrations are reached.

It should be remembered that the test for activity of heparin is simple, that it can be performed at the bedside and that it involves alterations in coagulation of the whole blood; on the other hand, the test for effectiveness of dicumarol does not involve alterations in the coagulation of the whole blood and it cannot be performed at the bedside.

The disadvantages of the use of heparin are:

1. It is expensive.
2. It must be administered intravenously.
3. It produces hemorrhagic complications at the site of injection and elsewhere.

The disadvantages in the use of dicumarol are:

1. The effect of the drug must be controlled by complicated laboratory procedures.

Heparin is available in definitely standardized quantities. The Toronto unit of heparin is defined as the quantity of anticoagulant contained in 0.01 mgm. of heparin.* Heparin is packaged in 10 cc. vials containing 10 mgm. per cubic centimeter of diluent.**

Heparin can be administered by continuous intravenous drip or by periodic intravenous injections⁷. The quantity to be given will depend upon individual variations but in general the dose will be adjusted so that the whole blood coagulation time should be prolonged to at least twice the normal value and preferably between 20 and 25 minutes (Lee and White method).

For continuous intravenous injection, the heparin is dissolved in physiologic salt solution or 5 per cent glucose solution, so that the resultant concentration is 10 units of heparin per cubic centimeter of diluent. A priming dose of 10-30 mgms. (1000-3000 units) is given intravenously and followed by the continuous delivery of 10 mgms. (1000 units) per hour. The area of venipuncture should be carefully tamponed or else a hematoma will develop at the site of puncture.

For periodic intravenous injection an initial dose of 30 mgms. (3000 units) of heparin is given and it is followed by 20-40 mgms. (2000-4000 units) doses at 2-4 hour intervals, depending upon and controlled by the whole blood coagulation time obtained in the individual patient.

Heparin should not be given sooner than three hours after an operation. The complications of heparin administration are the development of

CONTRASTING CHARACTERISTICS OF HEPARIN AND DICUMAROL

	<i>Heparin</i>	<i>Dicumarol</i>
Dose	Variable. (V) 1000 units per hour or 50 mgms. every 3 hours. Control by coagulation tests.	Variable, approximately 300, 200, 100 mgms. 3 successive days. Must be controlled by prothrombin tests.
Method of Administration	Intravenous (Continuous Drip, Multiple Divided Doses).	1. Oral 2. Intravenous.
Initial Response Occurs	Immediately.	24 to 72 hours.
Effect Manifested by	1. Prolongation of coagulation time. 2. Inhibition of platelet agglutination.	Prolongation of prothrombin, and late by coagulation times.
Effect Antagonized by	1. Protamine systematically. 2. Trypsin 3. Thrombokinas } locally. 4. Snake venom	1. Transfusions of fresh whole blood. 2. Vitamin K 60 mgm. doses.
Duration of Effect	1-4 hours dependent upon dose.	2-26 days; average 11 days.
Hemorrhagic Manifestations	Hematomata, Hematuria, Cerebral hemorrhage.	Purpura, Ecchymoses, Hematuria, Gingival hemorrhage, Epistaxis, Conjunctival hemorrhage.
Hemorrhagic Tendency Controlled by	1. Protamine. 2. Blood transfusion.	Transfusions of fresh whole blood or plasma. Vitamin K.

Adapted from.⁴

2. There is a lag period of 24 to 48 hours in its effect after oral administration.

3. The effect after cessation of oral administration of the drug may last from 2 to 26 days (average 11 days).

4. Hemorrhagic complications, when they occur, are generalized.

* The original heparin obtained from the Connaught Laboratories was a sterile solution dispensed in 10 cc. vials and containing 1000 cat units per cubic centimeter. One unit of this product would keep one cubic centimeter of cat blood free of clots for 24 hours in cold storage.

** The Abbott Laboratories preparation is standardized according to the Toronto unit; that is, 1 mgm. equals 100 units, or 1 cc. (10 mgms.) is equivalent to 1000 units. One unit of this product will keep 5 cubic centimeters of human plasma fluid in vitro for four hours at 37° C.

hematomata at the site of injection if these areas are not adequately tamponed; and hematuria and cerebral hemorrhage if the doses administered are too large.

An advantage of heparin is that its effects are dissipated within three hours following injection. Heparin (an acidic substance) is readily and immediately neutralized by protamine (a basic substance) which can be given intravenously. An outstanding disadvantage to the use of heparin is its costliness.

Dicumarol is available as a synthetic and standardized substance in 50 mgm. tablets and 100 mgm. capsules. It is given orally and is freely absorbed through the gastrointestinal mucosa. Dicumarol, it is believed, interferes with the formation of prothrombin in the liver.

Following adequate dosage the prothrombin concentration drops to a desirable level within 24-48 hours. The maximum effect, in terms of suppression of the prothrombin concentration, may occur within 3-5 days following the institution of treatment and recovery may be delayed from 2 to 26 days (average 11 days) after withdrawal of the drug.

In regard to dosage a safe rule to follow, provided that the prothrombin concentration is frequently checked, is 5 mgms. of dicumarol per kilogram body weight on the first day and 1.5 mgm. per kilogram per day thereafter until the desired effects are obtained.

The following plan for the administration of dicumarol has been suggested:

1. 300 mgms. of dicumarol orally on the first day.
2. 200 mgms. on the second and subsequent days until the prothrombin concentration falls to 20 per cent of normal.
3. If the prothrombin concentration falls too rapidly, proceed cautiously by withholding subsequent doses and checking the prothrombin values at least once daily. If the prothrombin concentration rises too rapidly, larger or more frequent doses of dicumarol may be given.
4. When the prothrombin concentration falls below 20 per cent, discontinue the use of dicumarol unless it is desired to depress the prothrombin concentration to the dangerously low levels between 5-10 per cent.

5. Dicumarol administration *must* be controlled entirely by laboratory determination of the prothrombin concentration in each individual who receives the drug.

In order to obtain the desired effect from dicumarol, the prothrombin concentration must be depressed and kept around 20 per cent of the normal level. At 20 per cent prothrombin concentration, the *whole blood coagulation time* becomes altered and when the prothrombin concentration is reduced to 5 per cent of normal the *whole blood coagulation time* becomes prolonged to twice normal. The recommended suppression of the prothrombin concentration to 20 per cent is a compromise because the whole blood coagu-

lation time may not be significantly altered at this level.

Administration of dicumarol is contra-indicated in diseases of the liver and kidney because they increase the sensitivity of the patient to the drug. It is also contra-indicated in patients suffering from any hemorrhagic disorder. In patients suffering from fever, dicumarol depresses the prothrombin level markedly and in direct proportion to the hyperthermia so that the drug must be given with extra caution under such circumstances. In some individuals salicylates, sulfonamides, and quinine exert a dicumarol-like effect.

When the prothrombin concentration drops to 10 per cent of normal, toxic effects are very likely to occur and these include purpura, hematomata, hematuria, and bleeding into wounds, gingivae, retinae, nasal, conjunctival and gastrointestinal mucous membranes, and into the tissues of the central nervous system.

The treatment of the hemorrhagic complications of excessive dicumarol administration consists of whole blood transfusions, and vitamin K in 60 mgm. doses (given as Menadione) every eight hours.

In circumstances where it is necessary to obtain an immediate and protracted effect of anti-coagulants, such as in the treatment of acute pulmonary embolism, it is desirable to induce the anti-coagulation effect by giving heparin intravenously and at the same time giving a standard dose of dicumarol orally. When the desired prothrombin concentration is reached, usually 48 hours after the institution of treatment, the heparin may be discontinued and the patient thereafter maintained on the effective dose of dicumarol controlled by repeated tests of prothrombin concentration.

SUMMARY

A discussion is given of the mechanism of blood coagulation and some of the factors which influence the stability of the blood *in vivo*. The relationships which the anti-coagulant substances bear to the coagulation mechanism are indicated and details of the administration of heparin and dicumarol are outlined.

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Prepayment and the Future of American Medicine*

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AMERICAN medicine is as fully involved in the current socio-economic turmoil of our national life as is labor, management, insurance, utilities and all other forms of endeavor. The keynote of our present travail is that the people as a whole are insistent upon a larger measure of economic security within the framework of democracy and political freedom. The peoples' decisions with respect to specific needs such as medical care will be oriented toward private enterprise on the one hand, or governmental responsibility on the other, directly as private groups honestly and effectively meet the full needs of the people in an acceptable manner. This precludes the exercise of the physician's venerable prerogative that if a patient cannot meet the cost of medical care on the doctor's own terms, he shall be relegated to the public wards as an object of charity. Our initial worthy practice of caring for the poor in terms of kindly charity has too frequently been perverted into a means of maintaining a unilaterally imposed fee structure. Too frequently methods of practice have been determined by a vocal minority whose credo has a precedent in the ancient medieval school of Salerno; viz.

"Don't give your service gratis; let not
the wise muse of Hippocrates

Serve the sick in bed without reward"

"A medical rule is given to the physician
thuswise,

That he should say; give, give until the
patient cries oh! oh!

While the patient is suffering let the
physician be firm in his demand,

Let him ask for immediate payment or
get security."

Woe to American medicine if our leadership falls into the hands of the modern counterpart of the men of Salerno!

All credit to you physicians of California who, under the leadership of men of vision, blazed the way in initiating the medical profession into its new responsibility of readjusting medico-economic concepts in the light of the realities of modern economic practices. In Massachusetts we studied your methods and learned from you. But in all honesty, I must admit we examined not only your virtues, but your weaknesses as well. The first we emulated, the second we sought to avoid. Now at the eleventh hour of our destiny, with the words Wagner, Murray and Dingell on every medical lip, we are fearful because in some respects you seem to have faltered. If you whom

we copied should reverse, than we in Massachusetts are faced with the possibility of having built on shifting sands.

Consequently with full sincerity, and seeking only profitable knowledge for each of us, I pose these challenging questions:

1. Why has Massachusetts in four short years shown a vigorous growth which has surpassed the effort of seven years in California?

2. Why is Massachusetts favored with a large degree of public confidence as compared to California?

3. Why has Massachusetts been blessed with full professional peace and cooperation based on the participation in our program of 85 per cent of practicing physicians?

4. Why has Massachusetts consistently operated in the black financially, with payments in full to the profession, and with the creation of a substantial surplus?

5. Why is Massachusetts able to contemplate extension of benefits while you now seem to disagree upon first principles?

6. Why has Massachusetts enjoyed full confidence and cooperation in dealing with our essential ally—the Blue Cross Hospital Service—while California suffers distressing and disrupting misunderstandings with them?

I pose these several questions only as an interested party looking squarely at the facts of the situation, seeking answers for the benefit of other states as well as for ourselves. To this end I shall discuss the experience of Massachusetts Medical Service under the following headings: (1) Organization; (2) Character of Contract; (3) Service Principle; (4) Financial Experience, and (5) Integration with Blue Cross.

ORGANIZATION

The legal organization of Massachusetts Medical Service is based on a careful preliminary study of corporate organization, procedure, law and public relations. A basic premise in our corporate structure is that there exists in this non-profit enterprise a large public interest due, first, to a sizable collection of public funds; second, to the public need for medical care; and, third, to the public interest in the type of medical care it will procure from the corporation. We have accepted this current hallmark of American practice: that wherever there properly exists a large public interest, therein shall be adequate public representation.

On this healthy premise we created a Board of Directors (Figure 1) consisting of one-third businessmen, one-third subscriber representatives,

* Address before the C.M.A. House of Delegates, Tuesday, May 7, 1946.

FIGURE 1.—*Massachusetts Medical Service Corporation*

MASSACHUSETTS MEDICAL SOCIETY

1. Creates corporation
2. Controls it, by district elections, through the voting members

VOTING MEMBERS OF CORPORATION

(THE 23 MEMBERS OF THE EXECUTIVE COMMITTEE OF THE COUNCIL OF THE MASSACHUSETTS MEDICAL SOCIETY)

1. Elect Board of Directors
2. Terminate directorship
3. Change by-laws
4. Receive notice of changes by the Central Professional Service Committee

BOARD OF DIRECTORS

(5 PHYSICIANS; 5 SUBSCRIBERS; 5 UNSPECIFIED)

1. Supervises and controls administrative matters with
 - a. Medical director and assistants
 - b. Administrative Committee(?)
2. Supervises and controls financial matters with
 - a. Administrative group
 - b. Finance Committee(?)
3. Appoints Actuarial Research Committee (at least 3 members)
4. Appoints Central Professional Service Committee (5 members, of whom chairman and 3 others must be physicians); this committee has sole power to initiate changes, reporting them to the voting members, on the following:
 - a. Extent of medical benefits
 - b. Basis of compensation
 - c. Standards of medical care
 - d. Discipline of physicians
 - e. Qualifications of specialists
 - f. Extension of income groups

DISTRICT ADMINISTRATIVE UNITS

(MAJORITY PHYSICIANS; CHAIRMAN PHYSICIAN, ELECTED BY DISTRICT SOCIETIES)

1. District administrative committees
2. District professional service committees all physicians
 - a. Have sole power of concurrent action with the Central Professional Service Committee
 - b. Supervise locally the quality of medical care
 - c. Discipline local physicians
 - d. Determine qualifications and furnish lists of local specialists for the benefit of subscribers (optional)

and one-third physicians. Since our destiny, technical skills, and welfare as medical practitioners are involved in this venture, the physician representation must admittedly be adequately safeguarded. But by setting up a broadly representative board we immediately commanded public confidence and support. In addition we procured expert help in all the business, financial and administrative details with which physicians are not generally familiar. We preserved proper control of strictly medical matters by empowering the medical representation on the Board to have the right of initiating action with reference to (1) fee schedules, (2) contract benefits, (3) discipline of physicians, (4) designation of specialists, (5) standards of medical care, (6) income limits for the service benefits.

Thirty days prior to definitive action on any of these matters, the proposed action of the Board must be laid before the twenty-three man Executive Committee of the Council of the Society, which also constitutes the voting membership of the corporation in behalf of the Council and the profession. Their capacity is only advisory in behalf of the profession. But certainly in a medical problem their advice would be seriously heeded. The confusion of carrying all organizational problems to the large 200 man Council of the Society is avoided. The Council has retained power only over the problem of income limits. The Board of Directors still has full power of decision and action. This preservation of the right of advance information to proper represen-

tatives of the doctors on vital medical matters, with the opportunity to present timely advice if needed, is little enough power to conserve to free entrepreneurs who are voluntarily throwing their whole destiny into this venture.

The voting members (Executive Committee of the Council) have the power to elect the directors and to change the by-laws. Thus control of essentially medical matters within the corporation should not be mismanaged in matters vital to the profession. This effective structure stands in sharp contrast with those state organizations in which the profession has sought outright control of the Boards in even non-medical matters by requiring that a majority, or three-fourths or four-fifths of the membership of the board be physicians. How impractical is the action of one professional group in creating a board composed entirely of physicians except for one layman, as has been done. Certainly such a group is as guilty as Russia of creating an "iron curtain" so far as public access to information about such a venture is concerned.

Vital in our organization is the tie-in with the local profession by way of Local Professional Service Committees. These have been created in each District (County). However, these committees have no local power of review on the decision of the 200 elected representatives to the Council who have created this corporation. No county society has power formally to withhold from participation. The power to act on medical matters of statewide importance should reside in

the Council, and separate counties should have no more right of censorship after definitive action has been taken by a State Medical Society than that, in the political realm, states should review the action of the Congress in national affairs, or counties should censure the State in state affairs. The anarchy of such procedure, which is foreign to our Republic and was rejected in 1865 after a trial at arms, has produced confusion and disruption in many state medical programs where such censorship by the counties has been tolerated. Any program based on our experience in Massachusetts should be initiated by the State Society on a statewide basis, and with full participation by every county on the basis of the primacy of State Society action in such a matter.

CHARACTER OF CONTRACT

Two main currents of thought have evolved in regard to the character of the initial basic contract. The first is that one developed in the urban states which provides protection against the catastrophic illnesses in the hospital (surgery and obstetrics); the second is that developed in the rural sections in which it is held that home and office medical care should be a major part of the first contract. The Massachusetts program was initiated with the surgical-obstetrical contract.

A quick survey of the economic background in Massachusetts, a state with 5,000,000 people and 7,000 doctors, will show why, as a predominately urban and industrial state, we made this initial departure. Figure 2 shows the distinctly urban character of our state, although the small rural proportion is acquiring an increasing importance. Figure 3 clearly depicts the dominant distribution of the industrial wage earners through the secondary cities and towns of the state as con-

FIGURE 2. *Percentage Distribution of Population, Urban and Rural*

Region	1940	1930	1920
	%	%	%
Urban	86.1	90.2	94.8
Rural	13.9	9.8	5.2
Rural-farm	2.9	1.9	1.6
(Federal Census 1940)			

trasted with metropolitan Boston. Consequently, any program, if properly conceived must be related to this important extra-metropolitan distribution of industrial wage earners, as well as to the important metropolitan area, and, consequently, it must be erected on a solid statewide basis. Figure 4 shows the marital status of the population (only 36.3 per cent single) and Figure 5 the number of families with children (59 per cent), all of which stresses our obligation to think in terms of family needs in evolving our programs. Any thinking which relates earnings and services to the individual rather than to the family need is neither socially nor economically adequate.

Massachusetts has reached the second stage in the evolution of this limited type of coverage and further benefits are now to be added for the subscriber. One of two choices is available. Medical care in the hospital could be added to our present contract without increase in the present premium rates of 85 cents (individual), \$1.65 (man and wife), and \$2.00 (family). This is based on current experience which provides surgery and obstetrics in the hospital for 58 per cent of corporation income; medical care in hospital for 8 per cent (estimate); out-patient surgery for 4 per cent (estimate); administration for 15 per cent;

FIGURE 4.—*Marital Status of Population*

Status	Number	Per Cent
Single	545,566	36.3
Married	870,510	58.1
Widowed	72,410	4.8+
Divorced	10,610	
Unknown	2,808	
Total	1,501,904	

FIGURE 5.—*Families with Children Under 21 Years of Age*

Children under 21	Number	Per Cent
No children	428,088	41.0
1	202,025	19.8
2	160,157	15.7
3	100,160	9.8
4	58,846	5.8
5	33,324	3.3
6 or 8	34,350	3.4
9 or more	4,210	0.4

FIGURE 3.—*Relative Importance of Population Units in State (1938)*

Area	Number of Estab- lishments	Number of Wage Earners	Per Cent of Wage Earners	Wages Paid	
43 towns	801	69,740	19	\$73,104,911	
38 cities	4,412	251,586	67	277,768,154	
Boston (city)	2,255	54,160	14	64,603,088	
Boston (Metropolitan)	4,150	134,317	36	160,123,677	
Towns and cities (extra- Metropolitan)	3,348	240,899	64	255,352,482	
Metropolitan Boston; 14 cities and 29 towns:					
Cities			Towns		
Boston	Melrose	Arlington	Dover	Norwood	Walpole
Cambridge	Newton	Belmont	Hingham	Reading	Watertown
Chelsea	Quincy	Braintree	Hull	Saugus	Wellesley
Everett	Revere	Brookline	Lexington	Stoneham	Weston
Lynn	Somerville	Canton	Milton	Stoughton	Westwood
Malden	Waltham	Cohasset	Nahant	Swampscott	Weymouth
Medford	Woburn	Dedham	Needham	Wakefield	Winthrop

and surplus 15 per cent. However, we plan with a moderate increase in the rates (95 cents, \$1.90 and \$2.25) a more adequately conceived contract which will provide complete medical, surgical and obstetrical care in the hospital as well as surgical coverage in the home, office or hospital outpatient department; obstetrical delivery in the home; and diagnostic x-ray for hospitalized cases with radiation therapy in lieu of surgery in the hospital or doctor's office. This will leave uncovered only the matter of medical care in the home and office. Experience has proved that ventures in this latter field on an extensive scale may be hazardous and costly because of abuses which are difficult to police, both on the part of the public and of the profession.

The second viewpoint that care in the home and office in agricultural regions is a primary concern should be carefully scrutinized. It would appear basic that the proportionate need for in-hospital and out-patient care should be the same for any given group, whether in rural or urban regions. Any statement that there is less hospitalization in the rural areas may well be met with the query, "Are there adequate hospital facilities there?" If not, should not this inadequacy be met directly rather than creating an improperly conceived prepayment program because of the deficiency? It may properly be wondered whether the inclusion of home and office medical care in these rural area programs has been conceived more as a result of insistence on the part of the physician that he be compensated by the corporation for these services, than as the consequence of an impartial recognition of the basic needs of the patient. Furthermore, coverage for home and office medical care is frequently on a cash indemnity basis which strikes at and threatens the superstructure of a service contract for hospital care.

SERVICE BASE OF CONTRACT

Massachusetts Medical Service as of today stands as a challenge to the defeatist concept that prepaid medical care cannot be provided on a service basis. We operate solidly on a service basis for the under-income group of patients. Over-income groups only are enrolled on a cash indemnity basis. We do not hesitate to inform an under-income subscriber that he need pay no extra fee, and the physician that he has no legal grounds for collecting an extra charge. We never disburse a penny to a non-participating physician except in the case of a bona fide emergency where services of a participating physician could not be procured. There is less than 3 per cent utilization of non-participating physicians. On this basis we now have the active cooperation of over 85 per cent of the practicing physicians in the state. We started our program with the support of nearly 50 per cent of the profession enrolled.

A service contract is essential for two basic reasons. First, it alone meets the needs of that large under-income segment of the public for

some guarantee of service on an equitable basis, with protection against overcharge which may too frequently be excessive. Only with the knowledge of such assured protection will the public buy in a volume which will make the voluntary approach to this problem a success and thus forestall federal action in the field of prepaid medical care. Second, it is essential from the physicians' viewpoint. The profession participates in this program at a slight sacrifice. With practically complete physician participation in Massachusetts, why should the subscriber be awarded benefits on the basis of selection from amongst the small group of non-participating physicians. Should he not forfeit his premium benefits which were made on the basis of a contract with the participating physician? Also, why should a non-participating physician be benefited by assured payment? The service contract is the morale basis of physician participation without which the whole program might eventually fall apart. If non-participating physicians are paid and they in turn make extra charges to the patient, how long before the physician next door working on a service basis will rightly conclude that someone is making a monkey out of him, and begin to make extra charges. Soon the public is incensed over extra charges. They are disillusioned with the misrepresentation of protection made by the profession, and the vital ingredients to success—public confidence and professional cooperation—are speedily lost.

The objection to a cash indemnity contract is the raw fact that it encompasses a rejection by the profession of its proper responsibility to the under-income group of the people; it is the raw fact of irresponsible individualism whereby the physician seeks to impose on these people a unilaterally constructed individual fee table (usually in the specialties) too frequently based on caprice, conceit or greed, rather than on a humane concept of equity and fairness. It is an escapist's make-shift too often supported by shortsighted spokesmen of our medical organizations. It has been adopted in some states with the bland assertion that it saves a lot of headaches. It fosters such practices as a charge of ninety dollars for cystoscopy and pyelography; one hundred seventy-five dollars for an appendectomy on a shop girl; three hundred dollars on the line for cystoscopic investigation of dysuria; five hundred dollars for a transurethral resection on a man whose income was little over five hundred dollars a year in his old age. Modern counterparts of the practices of Salerno! Such practices are rapidly precipitating on our heads the final and overwhelming headache of compulsory health insurance which cannot be treated simply by our being against it.

Gentlemen I give the profession two specific challenges. If the Doctors Lahey, Clute, Phaneuf, MacAusland, Allen, McKittrick, Kimpton and Smithwick of Massachusetts, all national figures, will render the people this service, what justification is there elsewhere in the nation for doctors to refuse to descend into the arena of public

affairs and do likewise? The second challenge comes from a national authority working on our side of the fence who made the bald statements to me that (1) there is no use in medical societies attempting any such programs unless on the service principle for the under-income group, and (2) that the only real cause for the failure of such programs is the doctors themselves! It is high time that these facts be brought to the light of day and not hidden behind an inept censorship within our own ranks.

The use of a service contract for the under-income group requires a determination of income levels of eligibility for service. In some states the family level is \$3,000, in others it is \$2,500 and the individual level is \$2,000. When these programs were initiated about 1940 there was general acceptance of the need for protection of family groups within these income limits. Now, due to an amateurish twist in economic thinking, some doctors are saying that wages are higher and that premiums and professional allowances should be higher. Let us look at the fact of what has happened to the family in Massachusetts with the still fixed limit of eligibility for service benefits at a \$2,500 income level. Figure 6 shows the increase in the cost of living for this family group in the purchase of such basic necessities of family life as food, clothing, shelter, fuel, etc. With their fixed income of \$2,500 the cost of living has risen from an index figure of 100 in 1940 to the high index figure of 126.9 in 1946. In other words, because of inflated values and a depreciated currency, every dollar worth 100 cents in 1940 will now buy only 77.5 cents' worth of family necessities, including medical care. This can only mean expanding hardship for people with these fixed incomes. This chart also exposes the present real income of our clients with \$2,500 incomes in the present period of money depreciation. The actual purchasing power of \$2,500 (1940) has been reduced to an actual \$1,936.48 (1946). As a corollary, if we were equitable in establishing the level of need in 1940 at \$2,500, then today we might be told with propriety that that figure should properly be reset at \$3,227.50, the comparable income base in terms of the cur-

rent cost of family living. Massachusetts is weighing the advisability of raising the income limit for service to \$3,000. Figure 7 shows graphically this tragic depreciation of real income for the under-income group with a fixed annual income of \$2,500, and the equivalent rise of income which would be necessary to stabilize the family budget at the same point as of 1940. We must have the realism to see that these people are caught in a financial squeeze between the depreciated dollar and the rising cost of living and that if we throw medical costs into the cauldron for these low income people we are but inviting government intervention. Today it is more difficult for them to meet our premium rate, not easier.

Figures 8 and 9 indicate the falling level of eligibility for service benefits on the basis of higher wage rates—*for those who get them*. On the basis of this shift the physician, by virtue of his privilege to make extra charges for the over income groups, is not called upon for undue sacrifice. In 1938 (Figure 8) at the \$2,000 level, 95.5 per cent of individual wage earners were eligible for service benefits. However, in 1943

FIGURE 7.

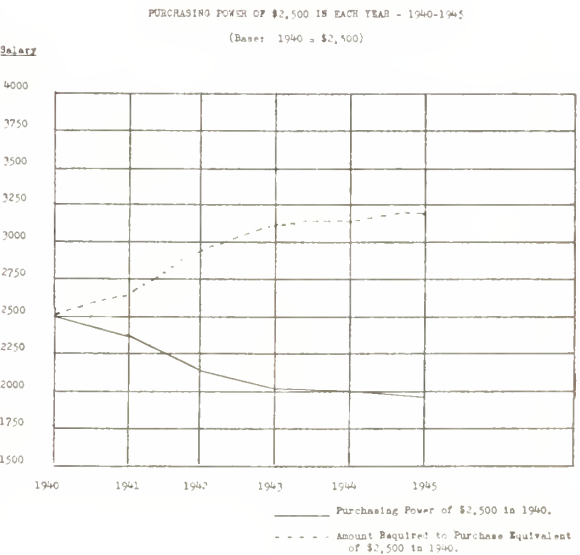


FIGURE 6.—Purchasing Power of \$2,500 in Each Year, 1940-1945, and January and February, 1946

(Base 1940 = 100)				
	Index Numbers* Combined Cost of Living in Massachusetts	Purchasing Power of the Dollar Base 1940 = \$1.00	Purchasing Power of \$2,500 Base 1940 = 100	Amt. Required to Purchase Equivalent of \$2,500 Base 1940 = 100
	(A)	(B)	(C)	(D)
1940	100.0*	\$1.00	\$2,500.00	\$2,500.00
1941	105.3*	.953	2,374.17	2,632.50
1942	117.3*	.853	2,131.29	2,932.50
1943	124.1*	.806	2,014.50	3,102.50
1944	124.7*	.802	2,004.81	3,117.50
1945	127.3*	.786	1,965.00	3,182.50
January, 1946	126.9	.775	1,936.48	3,227.50
February, 1946 . . .	126.9	.775	1,936.48	3,227.50

(Figure 9) with the same income level of \$2,000, only 78.8 per cent are eligible for service protection and the other 21.2 per cent have moved into the upper income brackets which receive only cash indemnity benefits from the corporation. This parallels the national picture wherein today fifteen million United States families have annual incomes of over \$2,500, the highest figure ever to be reached in the peacetime history of the country.

Figures 10 and 11 indicate the present wide, but abnormal and temporary, swing in wages as related to employment in Massachusetts. The essence of immaturity would be for a profession to make long term plans based on this brief period of abnormality. We had better just forget it and stabilize our programs. Figure 10 shows the

fairly constant curves of normal times, whereas Figure 11 shows the unreal war-stimulated rise in wages. For your orientation I quote from the Director of Statistics, Department of Labor and Industry, Massachusetts: "During the war period the changes were so abnormal that information obtained during any of the war years would probably be misleading for your purposes in determining medical care costs under normal conditions." If doctors and medical societies have once had a proper vision in creating these corporations, now is the vital time to fortify their ventures and not weaken them. To weaken the foundation of the basic principle of service protection for the under-income group will lead to overwhelming defeat in our major objective of distributing medical care while retaining our freedoms.

FIGURE 8.—Grouping of Weekly and Annual Wages of Industrial Workers (1938)

	Weekly	Annual	Number of Wage Earners		Per Cent of Wage Earners	Wage-Hour Law Correction
	\$ 8-10	\$ 400-500	4,143			
	10-12	500-625	17,710			
	12-14	625-725	37,087			
	14-16	725-825	66,988			
A	8-16	400-800	125,928	=	24.6	5.6
	16-18	825-925	61,062			
	18-20	925-1050	54,981			
B	8-20	400-1000	241,971	=	47.3	38.3
	20-22	1050-1150	45,132			
	22-25	1150-1300	55,320			
	25-30	1300-1550	69,172	+	= 460,450	= 90%
	30-35	1550-1800	48,945			
C	20-35	1000-1800	218,569	=	42.7	51.7
	35-50	1800-2600	50,360	=	10.0	
D	8-40	400-2000	488,324	=	95.5	

FIGURE 9.—Grouping of Weekly and Annual Wages of Industrial Workers (1943)

	Weekly	Annual	Number of Wage Earners	Per Cent of Wage Earners
	\$8-10	\$416-520	7,401	
	10-12	520-624	7,765	
	12-14	624-728	9,270	
	14-16	728-832	12,821	
A	8-16	416-832	37,257	6.6%
	16-18	832-936	19,337	
	18-20	936-1040	26,591	
B	8-20	416-1040	83,195	14.8%
	20-22	1040-1144	35,628	
	22-25	1144-1300	59,811	
	25-30	1300-1560	102,475	
	30-35	1560-1820	86,996	
C	20-35	1040-1820	284,910	50.8
D	8-40	416-2080	442,061	78.8
	35-50	1820-2600	192,765	34.4
E	8-50	416-2600	560,860	100.0

FIGURE 10.

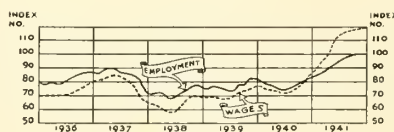
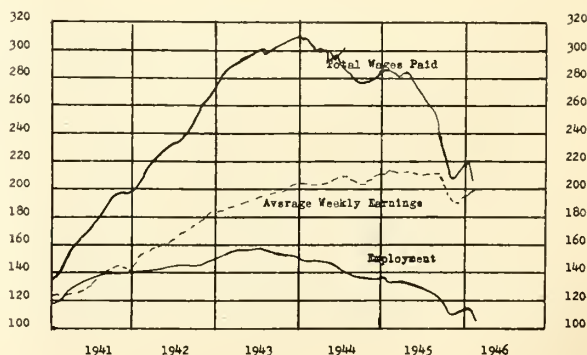


FIGURE 11.

TRENDS IN MANUFACTURING IN MASSACHUSETTS, ALL INDUSTRIES
(Average 1935: 39 = 100)



The financial experience of our program has been eminently satisfactory. We have operated continuously in the black; we have paid our physicians in full as agreed; and we have created a considerable surplus with which to extend subscriber benefits. Our experience may be weighed from four angles: (1) the premium structure; (2) the fee schedule; (3) surplus, and (4) expenses.

The premium rates for our surgical-obstetrical contract have been 85 cents per individual, \$1.65 for man and wife and \$2.00 for the family. These rates, if expenses and payments to physicians are kept in proper balance, will easily carry a surgical-obstetrical contract and create a considerable surplus with which to extend subscriber benefits. Our surplus now approximates \$300,000. Our experience indicates that this premium structure will also easily provide for medical care in the hospital in addition to the other services. Our establishment of a premium structure was no more scientific than to canvass the country for the experience of other plans and guess what rates would keep us in the black. These estimated rates were upped 25 per cent by the Insurance Department and the new estimated rates so nearly approximated the Blue Cross rates that we adopted their schedule. Do not let anyone delude you that a more accurate method of estimating rates existed up to now.

The second basic financial problem is establishment of a fixed fee schedule with definite allowances for specified services. Except in items where such fixed allowances are impracticable, no variation in payments should be tolerated. A solid actuarial experience can only be evolved when a stable premium structure is balanced constantly against stable disbursements to the profession on a mathematical base of exposure. Items which require individual consideration have in our instance been evaluated by specialist committees composed of three men. Our schedule of payments has ranged between \$75 and \$150 for the lesser to the heavier major surgical procedures. Non-major surgical procedures are evaluated proportionately downward. The arrangement has been accepted as basically fair by the bulk of leaders in the specialties in Massachusetts. If Frank Lahey of Lahey Clinic fame, Arthur Allen of the Massachusetts General Hospital, and Donald Munro of Boston City Hospital accept this schedule in Massachusetts, it is beyond my capacity to comprehend the grounds on which surgeons in other parts of the country fail to accept a comparable arrangement. In deference to my native heath I cannot accept any assumption that there is superior talent elsewhere. Only by keeping the payments to physicians within a proper range for the lower income group can the premium structure and the benefits available be so ordered that it will be worth while to become a subscriber.

The expense of administration may be kept at an extremely low figure with an automatically

administered fee schedule. Our total costs have ranged between 12 and 15 per cent. Our claim servicing personnel during our period of enrolling the first 100,000 subscribers consisted of a single male nurse and an increasing number of secretaries up to seven. Difficult problems, few in number, were referred to the specialty committees or the President for adjustment. With the growth of our corporation, longer continuance without the services of a medical director became impossible, and now Dr. Charles G. Hayden has joined our group in that capacity, infusing the necessary ingredients of enthusiasm, vision and experience. But again unity of effort is preserved by virtue of the fact that he serves both corporations, the Blue Shield and the Blue Cross.

On the basis of these practices, with 250,000 subscribers, our surplus has steadily grown until today it approximates \$300,000. We have furthermore paid back to the Massachusetts Medical Society its initial advance of \$25,000. This surplus of course stands as a buffer against unusual demands and as a source of increasing benefits to the subscriber.

INTEGRATION WITH BLUE CROSS

The one major reason for our rate of growth, in my opinion, has been the complete integration at the administrative level of a state-wide medical care plan with a state-wide hospital service plan. There is, however, as complete independence and separation at the level of corporate organization as there is between Blue Cross and the hospitals; but, on the administrative plane it is impossible to state where Blue Cross ends and Blue Shield begins. There is a common executive director, and medical director. There is joint use of sales, servicing, publicity, enrollment, etc., with proper allocation of costs on a contract basis. This unity has been purposely striven for and effectively created. We have been free of all frictions, controversies and divisive irritants which have characterized the Blue Cross-Blue Shield relationship in some other states. Besides administrative unity and high morale, this practice makes it possible to deliver to the public the maximum of medical service for each subscriber dollar. Fortunately for us the effective organizational capacity of our executive director, Mr. Reginald Cahalane, has not been denied us, although he has been tempted with beguiling offers from other states.

Contrast our organizational experience with the confusion apparent elsewhere in the nation: Blue Cross selling medical care on a cash indemnity basis and hospital care on a service basis; medical plans selling medical care on a service basis and hospital care on a cash indemnity basis; small county organizations selling hospital and medical care with a complete impediment to success from artificial county lines drawn between overlapping medical care areas; small county units censuring and impeding full statewide action of state medical societies by non-participa-

tion; medical societies succumbing to the meaningless and futile expediency of selling cash indemnity medical care contracts like any commercial insurance company, for no more noble motive than to dodge headaches with the local profession; Blue Cross demanding corporate dominance in an organization which provides medical care; physicians side-stepping their responsibility to future generations of practitioners by placing their destiny voluntarily in the hands of a corporation controlled by Blue Cross, or accepting minority representation in a corporation dominated by Blue Cross. Would that such medical groups had made a careful study of corporate practices and corporation history and were versed in the facts of the usurpation of corporate powers by management from both boards of directors and voting members! They should learn the significance of the book "Managerial Revolution" by Burnham. Of those medical groups which have stultified themselves by interposing a profit-making commercial insurance company between themselves and their patients, the less said the better! Such medical groups may be unwittingly writing their own obsequies.

PROGNOSIS

The present too slow expansion of medical care plans is disconcerting. The controversies and the backtracking may be demonstrating our own ineptness to a properly interested and certainly

informed public opinion. Our only defense in Washington today against a program of compulsory health insurance is the plea that we be given time to accomplish the objective of prepaid medical care on a voluntary basis. If we fail and are forced to return five or ten years from today to a Congressional hearing on the needs of compulsory health insurance, the accusing finger of the politician will then be pointed at us with the charge "Gentlemen you asked for time. You had it! In that time you have proved your incompetency to solve this basic national problem of prepaid medical care on a voluntary, free-enterprise basis. You have no other defense left! In 1946 you raised no other adequate defense! At that time you admitted all the problems which had to be solved. Good day, gentlemen! Government must now solve your problem for you in behalf of the public welfare." Doctors of California, we must not falter in our medical care programs, lest we burn our last bridge behind us! We must preserve and expand them. To accomplish any worthwhile purpose at all in the current American scene, this must be on a service basis for the under-income group. On this rampart we can defend our precious heritage, and serve as a beacon for our fellow Americans —

Lest under pretense of a better way
We find our country in the ancient snare
Of tyranny disguised in fulsome phrase.

—*Spellman.*

What the War Taught About Amputations*

PAUL F. OLSON, M.D., *North Hollywood*

BEFORE we return to more diversified civilian surgery, it might be well to record what the war taught regarding amputations. The policy of concentrating the amputation cases in centers provided a large surgical experience, and the close association with the limb-fitters contributed to the knowledge of what constitutes a stump suitable for a prosthesis. The resulting evaluation of the various types of amputations can well be carried over to civilian practice.

LISFRANC

A successful amputation can be carried out through the metatarsals, and if necessary the metatarsals can be disarticulated from the tarsals. Proximal to this point, however, one cannot perform a satisfactory amputation through the foot.

In performing a Lisfranc, it is necessary to preserve a long flap of the heavy plantar skin to cover the end of the stump. This amputation will,

of course, deprive the patient of the spring in his gait.

CHOPART

The Chopart amputation is mentioned only to deprecate it. Any amputation through the proximal tarsal bones will sever the insertions of the dorsi-flexor tendons and leave the Achilles tendon unopposed. What remains of the foot will go into an equino-varus deformity, and the ankle joint will be of little value. Such a stump is better converted into the Syme amputation, which will be discussed later.

PIRAGOFF

In the Piragoff amputation, the ankle joint is removed and the os calcis is placed on the end of the tibia. It provides a completely end-bearing stump, but has the disadvantage of bringing the end of the stump so close to the ground that it is difficult to incorporate a mechanical ankle beneath it. In this respect, it is inferior to the Syme amputation.

* The opinions or assertions contained herein are the private ones of the writer and are not to be construed as official, or reflecting the views of the Navy Department or the Naval Service at large.

SYME

The Syme is the best amputation in the region of the ankle. Where a Lisfranc amputation cannot be performed, the next site of election is the Syme.

In performing a Syme amputation, the heavy skin of the heel is placed over the end of the tibia. This amputation is of sufficient importance to warrant a more detailed description of the technique.

Two points are selected about one centimeter beneath the medial and the lateral malleoli. These points are connected by two incisions, one carried forward across the instep and the other downward across the anterior part of the heel. In order to insure the equal length of the two flaps, it is well to measure these two lines before making the incisions. The ankle is disarticulated and the os calcis removed by blunt dissection. It is of the utmost importance to avoid injury to the posterior tibial artery during these maneuvers. The tibia and fibula are sawed just proximal to the articular cartilage, and the heavy skin of the heel is secured over the end.

The Syme amputation is carried out through cancellous bone, which is a requisite to end-bearing. Also, it is covered by heavy skin. The patient can walk directly on it, which avoids the use of crutches around the house when the prosthesis has been removed.

The mechanical ankle closely reproduces the normal so long as the patient walks on level ground. The Syme amputation stump is durable and the prosthesis is functionally very satisfactory. However, the Syme has one important disadvantage. The prosthesis is bulky, and from a cosmetic viewpoint it is unsightly. It would be well to avoid a Syme amputation in a girl who values a trim ankle.

LEG

Amputations below the knee have given very gratifying results, the reason being that the foot and the ankle joint can be much more nearly reproduced mechanically than can the knee joint.

The weight is carried on the tibial condyles by a side-bearing type of prosthesis, and the stump serves merely as a lever which manipulates the artificial leg. The important muscles are the quadriceps and the hamstrings, which insert into the proximal end of the tibia. The muscles which are severed by the amputation are no longer functional; consequently, there is no advantage in a long stump. On the other hand, too short a stump will be lifted out of the bucket of the prosthesis by the hamstrings when the knee is flexed. About $6\frac{1}{2}$ inches of tibial length is optimum.

In performing an amputation below the knee, the anterior flap is laid out longer than the posterior, so that the resulting scar will lie posterior to the end of the tibia. As in other amputation stumps, it is desirable to cover the end of the stump by fascia as well as by skin. The fascia cannot be incorporated with the anterior flap, as

it blends with the periosteum over the crest of the tibia. However, a long flap of the posterior fascia can be used to cover the end of the stump, and the long anterior flap of skin can be closed outside it like a double-breasted coat. This maneuver will prevent the exposed ends of the muscles from becoming adherent to the skin.

After the flaps have been dissected back, the tibia and fibula are sawed through at the previously designated point. The fibula is subsequently shortened an additional $1\frac{1}{4}$ inches. The muscles are severed at the same level as the tibia and are beveled posteriorly. The large blood vessels are secured and the tourniquet removed. The nerves are gently drawn down, severed, and allowed to retract into the soft tissues. A nerve that becomes adherent in the scar on the end of a stump is apt to become painful. The crest of the tibia is beveled to give a well rounded stump, and the flaps are closed. The fibula contributes to the resilience of the stump and should be retained.

During the war, every effort was made to preserve the knee joint, as the best mechanical knee cannot approach the human knee in functional perfection. Where the amputation has to be carried out through the cancellous bone of the upper tibia, it is desirable to obtain a partially end-bearing stump. The very short fibula is removed, as it tends to become abducted and punch into the skin on weightbearing. If it is at all possible, the end of the stump is covered by intact skin and the scar falls well posterior. In a short stump, partial end-bearing helps to keep the stump in the bucket when the knee is flexed.

GRITTI-STOKES

To obtain an end-bearing stump it is necessary to perform the amputation through the cancellous bone at the distal end of the femur. In the classical Gritti-Stokes amputation the patella is placed on the end of the femur. In the modification of this operation the patella is removed and its capsule is placed over the end of the femur. In young men of military age, it is usually preferable to use the patella.

In performing the Gritti-Stokes amputation, or its modification, a long anterior flap is laid out, the incision crossing the mid-line over the insertion of the infra-patellar tendon. This incision is carried down into the knee joint, and the patella is included in the flap. The posterior incision crosses the mid-line one centimeter distal to the popliteal fold and is carried down through the fascia. The popliteal vessels are secured and the femur is sawed through the flare of the condyles. The posterior half of the patella is removed, and the patella is secured onto the end of the femur by ligatures through drill holes to prevent side slipping. The infra-patellar tendon is sutured to the posterior fascia to prevent the patella from tipping up when the quadriceps muscles resume their pull. The resulting stump preserves a maximum of the musculature of the thigh and, therefore, is strong and mobile. It provides complete end-bearing and is well regarded by the patients.

It is not so well regarded by the limb-makers, as it leaves no space in which to incorporate a mechanical knee, and the prosthesis has to be made with hinges at the sides. Patients with a Gritti-Stokes amputation walk very satisfactorily and can bear weight on their stumps indefinitely.

THIGH

Amputations through the thigh present special problems. The stump not only serves as a lever, but the muscles intrinsic in the stump motivate it. Consequently, the higher the amputation the greater the loss of musculature and the weaker the stump will be. This is particularly true of the power of adduction, and the reason is readily apparent when one considers that the adductor muscles insert on the femur all the way down to the adductor tubercle.

The longer the thigh stump, the better that patient will walk. It is, however, necessary to remove the distal four inches of the femur in order to allow room for the housing of the mechanical knee. The site of election of an amputation through the thigh is, therefore, four inches proximal to the knee joint.

In performing an amputation through the thigh, the anterior flap is laid out longer than the posterior so that the resulting scar will not lie directly off the end of the femur. The fascia is included in the flaps. The femur and the muscles are severed in one plane. The stump is covered by fascia and skin, which are sutured as separate layers. The interposition of the fascia prevents the skin from becoming adherent to the exposed ends of the bone and muscles. Postoperatively, a flexion con-

tracture is prevented by holding the stump in a neutral position during the healing. Exercises are instituted to strengthen and to increase the range of motion of the stump.

FOREARM

Much has been written about the present day artificial arms, and there certainly is great room for improvement. However, the sense of touch, which is so important in the natural hand, cannot be imparted to any artificial hand. Also, the hand is a much more delicate mechanism than the foot and is proportionately more difficult to replace.

One advance was made near the end of the war in amputations through the forearm. Prostheses were devised which utilized pronation and supination. Amputation surgery has been modified to meet this development. The pronator quadratus muscle is preserved, together with the distal articulation between the radius and the ulna. In order to taper the stump so that the prosthesis can be fitted on over the end, it is advisable to remove the styloid process of the ulna and to bevel the lateral flare of the radius. It is also well to remove the articular cartilage from the end of the radius. Such a stump will be rather long but will preserve the full function of pronation and supination.

A double arm amputee will become highly proficient in the use of his artificial arms through sheer necessity. A single arm amputee will, however require considerable training to develop reliance on his prosthesis, and lacking that training, he will be apt to discard his artificial arm.

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Maternal, Fetal and Neonatal Mortality*

DANIEL G. MORTON, M.D., *San Francisco*

I THOUGHT that it might be of interest to this group to consider the end-results which have been accomplished in the field of Obstetrics in the last ten or fifteen years, to examine the causes for these accomplishments, and to consider in what ways even better results might be achieved. The object of the procedures which are carried out in the care of prospective mothers, in their deliveries, and in the care of their newborn children is to afford the greatest possible assurance that avoidable complications will be reduced to the minimum, that as many mothers as possible will be carried through their pregnancies safely, and that their newborn children will be treated so skilfully that the neonatal death rate will be brought as near as possible to the irreducible minimum of inevitably fatal con-

ditions. With regard to maternal mortality, which is the measure of the efficiency of our efforts in obstetrics, this country occupied a rather unenviable position until recent years. The United States was far down the list with respect to its maternal mortality rate. (Table 1.)

TABLE 1.—Comparison of Maternal Mortality in the United States and Certain Foreign Countries (1932)

Country	Maternal Deaths Per 10,000 Live Births
Australia	56
Belgium	48
Canada	50
Chile	70
Denmark	35
England	42
Italy	30
Netherlands	30
New Zealand	41
Norway	26
Scotland	63
Sweden	27
United States	63

* Chairman's address. Read before the Section on Obstetrics and Gynecology at the Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

However, within the last ten years the rate has been constantly dropping in a perfectly remarkable fashion. The accompanying table shows this drop graphically. (Table 2.) Happily, the California maternal mortality rate has kept pace with this general improvement—and indeed California's rate is now much lower than the general average for the nation and is better than that for all except 12 other states. (Table 3.) Likewise the infant mortality rate has been constantly dropping. (Table 4.) Indeed, much of the increase in the average span of life—so widely heralded these days—is due to the elimination of many of the infant deaths which formerly occurred.

While all of the reasons for this improvement in results are not entirely clear, some of them are fairly certain. Discussion of them might well prove profitable because of their implications with regard to the maintenance of our present high standards and also with regard to future improvement.

TABLE 2.

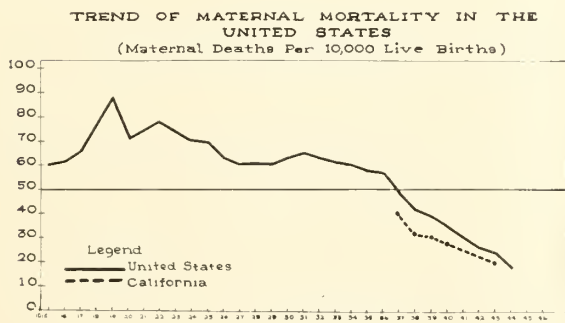


TABLE 3.—Maternal Mortality—By States (1943)

State	Number of Deaths Per 1,000 Live Births
Minnesota	1.4
Oregon	1.5
Wyoming	1.5
Connecticut	1.6
South Dakota	1.6
Utah	1.6
Washington	1.6
Iowa	1.7
Nebraska	1.7
Maryland	1.8
Montana	1.8
New Jersey	1.9
California	2.0
Indiana	2.0
Massachusetts	2.0
Nevada	2.0
Wisconsin	2.0
South Carolina	4.4
New Mexico	4.7

12 Ahead of California

TABLE 4.—Trend of Infant Mortality in the United States
Deaths Per 1,000 Live Births

	United States	California
1940	47.4	39.6
1941	45.9	37.2
1942	41.2	35.9
1943	40.7	35.1
1944	39.2	
1945	38.1	

In my opinion the most important factor in the drop of the maternal mortality rate, and probably also of the fetal and neonatal rates, is education. More specifically I refer to the present system of educating doctors after they have graduated from medical school, *the modern system of resident training*. Within the last twenty years there has gradually grown up in most of our medical schools, and in many first-class hospitals not associated with medical schools, a system of resident training in the various branches of medicine. This training involves specialization early in one's career, under the guidance of first-class men. Not infrequently four, five, or even seven years are necessary to complete the training. The men turned out are truly finished products. This is not to say that superior men are not produced in other ways, but it is my contention that this system, as an overall policy, has resulted in more well-trained men being turned out than any other system could produce. This has gradually had its effect, not only with regard to the brand of medicine practiced by the individual men themselves, but also with regard to the influence these men have had upon the type of medicine practiced about them. In this way there has been a gradual elevation in standards. The place of the well-qualified specialist has become recognized in the community, and there has grown up a demand for the type of knowledge which he represents. For instance, in the obstetrical field it is now the policy of many hospitals not to permit Cesarean sections without consultation with duly qualified specialists. Many hospitals go even further than this. It is such policies as these which have been established because of the presence of well-qualified men in the community.

The various specialty boards are a reflection of the recognition of the need for proper qualification in the various branches of medicine. The specialty boards might also be cited as a cause for our present improved mortality rates. The mere possession of a board certificate is, of course, of very little importance as such; what is important is the qualifications which they demand, and which young graduates of medicine are seeking more and more. The modern resident in the field of obstetrics, or pediatrics, the two fields of medicine with which we are concerned today, has been well grounded in the basic pathology of his particular branch of medicine; he has received careful and extensive tutorial instruction in the management of the common clinical problems which are likely to be encountered in everyday practice, as well as in the majority of the complications to be seen in his branch of medicine. Perhaps even more important, he has had an opportunity of shouldering the responsibility for the care of patients, and of carrying out the actual procedures involved in their care. It is well known, of course, that the way to learn to do a thing is to do it. These men have been given the opportunity to *do*. Is there any wonder then that the influence of such training is beginning to be felt? Unfortunately,

the war played hob with the resident system, in that the training in the various special branches of medicine was usually interrupted by a call to military service long before the individual men had completed their services. Possibly this was necessary. Nevertheless, it is devoutly to be hoped that a speedy return to the resident system of training can be realized now that the war is over.

As a corollary to this type of education, there has grown up a widespread interest in improved maternity care and in the whole subject of the preventability of maternal mortality. Studies have been made which have pointed out valuable lessons. Many hospitals have learned to review their results—and as a consequence more frequent and competent consultation has been demanded when operative procedures have been contemplated. These factors have unquestionably had a desirable effect upon maternal and fetal mortality rates. The worst obstetrical results have been obtained in those hospitals in which poor or no records were kept, staff meetings were infrequent, and consultations were not demanded. While such institutions are becoming scarcer, there is still much room for improvement in this respect.

Another potent factor in the reduction of maternal mortality has been the introduction of the sulfonamides and penicillin into the practice of medicine. Infection has always been, and still remains, the most important single cause of maternal deaths. I think that there is little doubt that modern chemotherapy is gradually reducing both maternal and fetal mortality from infection. It is not in the form of spectacular results that this has been accomplished, for we still see cases of full blown infections which are affected not a whit by these agents, but it is in the sphere of the prevention of serious infection that the sulfonamides and penicillin have been of special value. It is to be hoped that this value will be felt more and more as these agents are more widely and skilfully used. It has been shown, for example, that penicillin given to the mother is transmitted through the placenta to the fetus. Its more widespread use in prolonged labors, after premature rupture of the membranes, or where definite infection exists in the birth canal may well prevent many a fetal death as well as a serious maternal complication.

A third important factor in the reduction of maternal mortality is the more widespread use of blood in combating shock and in replacing blood loss. Shock and hemorrhage have been among the foremost causes of death—yet it has been abundantly shown that death has rarely resulted from these causes if proper preparations have been made for transfusion wherever a critical situation has existed, and wherever transfusions have actually been carried out before extreme states of exsanguination or shock have been reached. Timely transfusion has done much to reduce the mortality in such conditions as ruptured ectopic pregnancy, placenta previa, and

postpartum hemorrhage—to say nothing of its value in combating the infection which so often follows severe blood loss. The modern blood banks are playing now, and are going to play in the future, a large role in the prevention of maternal deaths.

There are many factors responsible for the reduction of fetal and neonatal mortality; more adequate antenatal care with all that it implies, especially the better management of the toxemias of pregnancy, the more careful use of operative vaginal delivery, a better appreciation of the dangers of analgesia, better methods of resuscitation, and perhaps most important of all, a better appreciation of the problems of the first few weeks of life. The latter can probably be ascribed largely to the resident system of training which we have already discussed. The largest single cause of neonatal mortality is prematurity. While the more skilful use of oxygen, the maintenance of body temperature through the use of incubators and properly heated nurseries, the maintenance of fluid balance, and the use of blood have done much to reduce neonatal mortality in premature infants, there still remains much to be accomplished here, not only in the prevention of prematurity but also in its management.

I have reviewed briefly for you what I consider to be the most important factors in the rather remarkable improvement in maternal and fetal mortality which has occurred in the last ten years. Without doubt there are other factors involved, some of which are obvious, and others of which are as yet quite obscure. Should we, now, congratulate ourselves and rest on our laurels? The answer, of course, is no. What then are the problems for the future? Just where should we attack? I do not wish today to becloud the issue with nebulous suggestions, but rather to discuss briefly the more outstanding issues.

First of all it would seem of the greatest importance to continue the development of the resident system which has already done so much. Young men in medicine should be encouraged to qualify themselves well in their chosen fields of medicine. Since this is a time-consuming and expensive program, it may become necessary to provide financial subsidy. Perhaps the various large medical foundations should be encouraged to contribute funds for such purposes; perhaps this is the means whereby the state and federal governments should make their contributions to the health of the nation. An even greater extension of post-graduate education should be fostered, so that relatively short, practical courses could be made available to all medical men who wished to refresh their knowledge. Perhaps subsidies would be needed for these purposes also. Indeed, some states already subsidize such programs.

Hospital standards should be elevated and made more uniform. This might be difficult to

achieve, though I have the feeling that if enough well qualified doctors were turned out into the various communities, good hospital standards would follow inevitably. They would have to; they would be demanded. Such a spread in good standards, with its demand for proper consultation, would inevitably result in a drop in the incidence of ill-advised and unwarranted operative procedures, with an immense saving in maternal and fetal lives. Since most infections are the result of poorly conducted labors in which the final event is an operative procedure, the furtherance of good hospital standards with all that this connotes is a direct attack upon this problem.

Possibly for the more remote smaller communities a consultation service is needed. This should not be too difficult to set up. I feel sure that the well-trained men all over the country would be only too glad to contribute a period of their time to such a service.

The importance of thorough and complete antenatal care must continue to be recognized; its virtues should be publicized even more than at present. For example, toxemia of pregnancy is responsible for one of the largest proportions of maternal and fetal mortality. It is in the prevention of toxemia and in the circumventing of its more serious forms that adequate and widespread antenatal care would prove a direct means of lowering our present mortality rate.

The value of blood transfusions must be con-

stantly emphasized, and we must seek to make blood available wherever pregnant women are being cared for. More blood banks must be established, especially for the smaller communities. What a boon this would be! This would be a direct attack upon the large segment of maternal deaths which still occur because of shock and hemorrhage.

Finally, the problem of prematurity must be tackled more vigorously. We are cognizant of many of the causes of prematurity—such as toxemia of pregnancy and placenta previa. The proper management of these conditions would do much to prevent many premature labors. In other instances we are still without an explanation, and herein lies a direct challenge to investigators in this field of medicine. Inevitably, really significant improvement in this field lies in the direction of prevention, though there is much yet to learn regarding the care of the premature newborn infant.

In this brief dissertation I have attempted to pick out those factors in maternal mortality which are susceptible of improvement, and to point out the general principles by which such improvement might be achieved. A group such as this, all men and women interested in good obstetrical care, can contribute much to the future by supporting these principles. Each of us, in our own communities, can accomplish a great deal by working on these problems directly with the tools at hand.

Pyelitis of Pregnancy*

W. DAYTON CLARK, M.D., *Stanford University Hospital*

PHYSIOLOGICAL changes of some degree occur in the urinary tract in almost all pregnancies. These changes are loss of ureteral muscle tone, diminution of ureteral peristalsis, ureteral dilatation and hydronephrosis. There may or may not be impairment of renal function.

These physiological changes usually begin during the fourth month of pregnancy, are more marked on the right side, progress rapidly during the fifth and sixth months of pregnancy, may occasionally regress to some degree during the last two months of pregnancy. However, the physiology of the urinary tract may not return to normal until as late as the sixth or seventh week after delivery.

Since Cruveilhier in 1843, first described dilatation of the ureters as a frequent accompaniment of pregnancy, the anatomical, physiological and pathological changes in the urinary tract during gestation have been investigated in considerable

detail and a great wealth of data has been compiled. It would be impossible to mention all the more outstanding investigators in this field, but we must name Traut³ and his associates, Hundley² and his co-workers and Crabtree¹ and his associates, as men to whom we owe much of our present day knowledge.

Most authorities agree that there are probably several causative factors in the production of the urinary tract changes. There is much evidence to support the contention that the most important factor is pressure from the pregnant uterus. The ureteral dilatation is marked above the pelvic brim, whereas there is rarely dilatation below the pelvic brim. There is usually little if any dilatation prior to the sixteenth week of pregnancy and it is during this week that the gravid uterus rises above the pelvic brim. As further evidence, ureteral dilatation has been repeatedly observed in patients with large pelvic tumors.

Dextro rotation of the uterus, cushioning of the left ureter by the sigmoid, and the fact that the right ureter crosses the common iliac artery at a right angle while the left ureter crosses the left

* Read before Joint Meeting of the Sections on Urology and Obstetrics and Gynecology at the Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

common iliac artery at an acute angle are all thought to explain the usual finding of a more marked dilatation of the right ureter and renal pelvis.

Evidence is accumulating to confirm the belief that endocrine changes, incident to pregnancy, may also play a part in the altered physiology of the urinary tract. Hundley, Diehl and Diggs⁴ have found that when non-pregnant women are given large doses of progesterone for periods of five weeks or more, ureteral atony is induced, similar to that observed in the later months of pregnancy. Intensive estrogenic medication, on the contrary, results in increased ureteral peristalsis.

Thus it would seem that pressure by the pregnant uterus together with endocrine changes, are the important causative factors in the production of the physiological changes usually associated with pregnancy.

The result of the loss of ureteral muscle tone, diminished ureteral peristalsis, ureteral dilatation and hydronephrosis, is stasis in the upper urinary tract predisposing the pregnant woman to urinary infections. If this urinary stasis is superimposed upon pre-existing disease as obstruction, congenital anomalies, urinary tract calculi or chronic infection, the possibility of a pregnancy complicated by serious urinary tract disease is greatly increased.

The incidence of upper urinary tract infection or pyelitis of pregnancy is given by various writers as being from less than 1 per cent to more than 16 per cent. On our clinic service at Stanford the incidence is 3.7 per cent.

CLINICAL DISEASE ENTITY

The symptoms of pyelitis of pregnancy in no way differ from those of any pyelitis, namely, lumbar back pain, flank pain, pain along the course of one or both ureters, dysuria, urinary frequency, chills, fever, anorexia, malaise, and occasionally nausea and vomiting. Not all of these symptoms need be present at any one time or in any one case and those symptoms which are present may be sufficiently mild to permit ambulatory treatment, or the symptoms of pain, fever, chills and malaise may be severe enough to require hospitalization.

The laboratory findings are: leucocytosis, albuminuria, pyuria, bacteria in stained urine sediment and positive urine cultures. Blood urea is normal unless there has been renal damage as might occur in a neglected case.

BACTERIOLOGY

While any bacteria may invade the urinary tract, the organism most commonly responsible for pyelitis of pregnancy is *E. coli*. Non-hemolytic streptococci and staphylococci are not uncommonly found. Other pathogenic bacteria are less commonly found.

All possible avenues of infection must be con-

sidered. Most writers champion either the hematogenous route or an ascending infection. Invasion through the lymphatics or by spread from contiguous infections have been described.

PATHOLOGY

The pathologic lesions noted in a simple pyelitis of pregnancy range from ureteritis, to pyelitis, infected hydronephrosis, pyelonephrosis and perirenal or periureteral abscess. Because of the urinary stasis, infections are more difficult to control and tend to involve more tissue in pyelitis of pregnancy than in pyelitis in the non-pregnant individual.

RADIOGRAPHIC FINDINGS

The gross changes in the urinary tract during pregnancy may be demonstrated by intravenous urography or they may be demonstrated in more detail by retrograde urograms. The usual findings are ureteral dilatation above the pelvic brim, dilatation of the renal pelvis and dilatation of the major and minor calices.

CASE REPORT

A twenty-two-year-old primipara 4½ months pregnant entered Stanford University Hospital with the complaint of intermittent right flank pain for the previous month. The pain had been gradually getting worse for the previous four or five days and occasionally radiated into the right hip. There was mild dysuria and day and night frequency. Nausea and vomiting had developed twelve hours prior to entry. On entry, her temperature was 37° C, pulse 76, respirations 16 and blood pressure 112. The positive physical findings were

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confined to the abdomen. The gravid uterus rose 18 centimeters above the pubic symphysis. There was marked right costovertebral tenderness and moderate guarding of the muscles of the right flank. The clinical diagnoses were:

- (1) Normal intrauterine pregnancy at 4½ months.
- (2) Right hydronephrosis with possible right ureteral obstruction.
- (3) Pyelitis of pregnancy, mild.

The positive findings on urinalysis were ten to fifteen pus cells per high dry field. The stained smear was loaded with streptococci and gram-negative bacilli. A complete blood count was within normal limits; blood Wassermann was negative. Excretory urograms obtained the day following entry (Fig. 1) show a foetal skeleton corresponding to a 4½ to 5 months pregnancy. The diodrast appeared promptly from the left kidney outlining an unexpected finding of a bifid kidney. The minor calices in both the upper and lower portion of the bifid kidney show the normal cupping. The renal pelves are not dilated and the left ureter is approximately normal in size. There is evidence of delayed excretion of the diodrast from the right kidney. The caliectasis of the right kidney is apparent. The second film (Fig. 2) taken five minutes after the first, and thirteen minutes after the intravenous injection of the diodrast, shows the dilatation of the minor calices, the renal pelvis, the ureter, and in addition, it is noted that there is a sharp



Fig. 1.—Excretory urogram—Fetal skeleton. Bifid left kidney. Caliectasis right kidney pelvis.



Fig. 2.—Excretory urogram.—Caliectasis right renal pelvis. Dilatation and angulation of right ureter.

angulation or kink of the ureter in its upper portion. It should be noted that the ureter is dilated below the kink as well as above. It seemed entirely reasonable that the demonstrated evidence of back pressure in the right kidney was probably the cause of at least some of the pain in that region. Therefore, a catheter was passed to the right renal pelvis resulting in immediate flow of urine under pressure. The catheter was left in place for three days, during which time the patient had considerable relief from the right flank pain. On entry, the patient had been placed on a regime of 0.5 gm. of sulfathiazole four times daily, which was continued until the patient was dismissed one week after entry, at which time urine cultures were negative and the patient was free of right flank pain. She was instructed to take 25 gm. of sulfathiazole four times daily at home. Upon return to our prenatal clinic in one week she stated that she had had only occasional mild right flank pain. A number 10 ureteral catheter was passed with ease to the right kidney pelvis with the prompt escape of approximately 25 cc. of urine, indicating a persistent mild obstruction of the right ureter.

TREATMENT

The most important type of treatment is prophylaxis. Preventive therapy begins at the patient's first visit when her past history is obtained. It is entirely inadequate to ask, "Have you ever had trouble with your urinary tract?" Childhood urinary disturbances, urinary tract difficulties with previous pregnancies, and so-called "Honeymoon Cystitis" are readily forgotten, and the patient's memory must be probed for such facts. Furthermore, many people explain occasional episodes of dysuria and frequency by the assumption that they have "caught a little cold in their kidneys" and promptly forget it. It is, therefore, mandatory that the patient be asked specific, direct questions, using words or phrases which she will be certain to comprehend, if the physician is to obtain accurate, pertinent knowledge of the urinary tract background prior to her present pregnancy.

If the past history does reveal evidence of previous urinary tract disease, then the minimum examination consists of a routine analysis of a specimen of catheterized bladder urine, the microscopic examination of a stained smear, a urine culture and intravenous urograms. Always obtain a preliminary survey film to rule out calculi. Furthermore, remember that, to be of real value, the urine specimen from a woman should be obtained by catheter. A voided specimen may be misleading.

If such a preliminary investigation reveals evidence of existing disease such as infection, obstruction, anomalies or calculi, then a more complete study is mandatory. Cystoscopy, retrograde studies, renal function tests and repeated urine cultures are indicated.

If there is evidence of chronic infection or if bacteria are found intermittently in the urine, an intensive search must be made for possible foci of infection including at least the teeth, tonsils, sinuses and the uterine cervix. Wherever possible such foci must be eradicated.

Any minimal urinary tract infection demands

eradication and every effort should be made to maintain a sterile urine throughout the entire prenatal course, the delivery and the puerperium. Usually this can be accomplished either by intermittent penicillin therapy or, if the organism is not sensitive to penicillin, by the administration of 100 to 250 mg. of sulfathiazole four times daily. This small dosage is sufficient to maintain a sterile urine and to date we have not seen a sulfathiazole reaction with such small daily dosages.

The problems encountered when a woman with existing renal disease becomes pregnant are well illustrated by a case recently seen. This patient first seen at 2½ months gestation with her second pregnancy gave no history of previous urinary tract disturbances even though she was carefully interrogated. However, less than one week after her first visit she was awakened at 3:00 o'clock in the morning with severe right flank and right lower quadrant pain accompanied by nausea and vomiting. These symptoms persisted until her hospital entry at which time a careful examination was made to rule out acute appendicitis. Physical examination revealed slight tenderness in the right costovertebral angle with tenderness also in the right lower quadrant along the course of the right ureter. There was no muscle spasm of the abdominal wall. Pelvic examination revealed three months uterine pregnancy and definite tenderness in the right parametria close to the cervix without other evidence of inflammation. Her temperature was normal, a complete blood count was within normal limits. Examination of a catheterized urine specimen revealed a moderate albuminuria, and a few red blood cells per high dry field, with some clumping of erythrocyte. A radiographic study suggested a right ureteral calculus.

Intravenous urograms confirmed the impression of a stone in the juxta vesicle portion of the right ureter. Cystoscopic examination revealed blood and cellular debris coming from an edematous right ureteral orifice. The right ureter was dilated with catheters. On the following morning the patient passed the stone spontaneously. The urine culture taken at the time of entry showed the presence of staphylococci albus, coagulase positive. Sulfathiazole (0.5 gm.) was given four times daily for five days and the urine was rendered sterile. The sterility of the urine has been maintained by 250 mg. of sulfathiazole four times daily. The importance of careful observation of this patient with repeated urine cultures throughout the duration of her pregnancy is apparent to all. Furthermore, at the end of the puerperium a thorough and careful examination of the urinary tract is definitely indicated in order, if possible, to prevent serious permanent sequelae.

AMBULATORY TREATMENT

At each office visit, the patient is questioned regarding symptoms referable to her urinary tract and even if there has been only a mild

dysuria or urinary frequency, a catheterized urine specimen is obtained for routine analysis, stained smear of centrifuged urinary sediment, and a urine culture. If bacteria or pus cells are found in the urine sediment, then 0.5 gm. of sulfathiazole is prescribed four times daily until the report on the urine culture is received. When urine cultures are sent to the laboratory, the bacteriologist is routinely instructed to do a penicillin sensitivity test if a positive culture is obtained. If growth of the organism is inhibited by 0.1 or 0.2 units of penicillin per cc. of media and if the micro-organism does not respond to sulfathiazole in vivo, then 50,000 units of penicillin are given four or five times daily intramuscularly for one or two days or until the urine is sterile.

If the specific bacteria are responding to sulfathiazole therapy as evidenced by relief of symptoms and sterile urine cultures, then as a prophylactic measure 0.25 gm. sulfathiazole four times daily is continued for two to four weeks. In our experience, a continued low dosage of the sulfonamide prevents exacerbations and tends to prevent recurrences. Throughout the remainder of the pregnancy, urine cultures are repeated at least once each month and at each visit the patient is carefully questioned regarding symptoms in order that active therapy may be re-instituted, if indicated.

In some cases we have continued, with good effect, 100 mg. of sulfathiazole four times daily during the remainder of the prenatal course, delivery, and puerperium.

HOSPITAL THERAPY

If ambulatory therapy fails, if there are repeated infections or if there is an acute fulminating pyelitis of pregnancy with severe pain, high fever (38.5°C or above), vomiting, and profound malaise, then immediate hospitalization is indicated. Here again urine cultures and a penicillin sensitivity test will indicate the drug to be used. For sulfonamide therapy we prefer sulfathiazole, although sulfadiazine and sulfamerazine will give practically the same results and are used whenever there is any degree of a sulfonamide sensitivity reaction to the sulfathiazole. The dosage is 2 to 3 gm. as an initial dose followed by 1.0 gm. every four to six hours.

The sulfonamides pass readily from the maternal circulation through the placenta into the foetal blood stream and blood levels in the foetal and maternal circulation are maintained at approximately the same level. In our experience, and in the experience of others, sulfonamide therapy, in the amounts used, has proved in no way deleterious to the foetus.

The fluid intake should be in an amount sufficient to result in a urinary output of at least 1200-1500 cc. for each twenty-four hours. Parenteral fluids are given whenever necessary to maintain adequate fluid output.

It is widely accepted that the crystallization of sulfonamides in the renal tubules can cause

oliguria, anuria, irreparable damage to the renal parenchyma, and possibly even death. Adequate fluid intake and alkalization of urine are the two most effective measures to prevent this serious complication of sulfonamide therapy. Gilligan, Schwartz and others have each shown that sulfonamide crystals are twenty to thirty times more soluble at a pH of 7.5 than at a pH of 5.0. We, therefore, give sodium bicarbonate in quantities sufficient to maintain an alkaline urine. This usually requires 12-18 gm. of bicarbonate of soda for each twenty-four hours. A daily determination of urinary pH will indicate the amount of sodium bicarbonate to maintain alkaline urine. Adjuvant alkali therapy is of proven value in the prevention of crystalluria.

Daily urine analyses are done to determine the urinary pH, and to note the appearance of sulfonamide crystals and erythrocytes. A complete blood count is done every second day and particular attention is paid to the hemoglobin and the total leucocyte count to note the appearance of a progressive anemia or leucopenia. If either complication of sulfonamide therapy should develop, the drug is immediately discontinued and some other type of medication, such as Mandelic acid, is resorted to.

If, in spite of penicillin or chemotherapy, the patient's temperature remains elevated above 38.5°C for more than five days, intravenous urograms are indicated to localize the main area of the urinary tract involved and the site of any obstruction. If evidence of obstruction is found, cystoscopy is performed and the obstruction is gently and progressively overcome by ureteral dilatation with graduated bougies. Catheters are then inserted to each renal pelvis, a P.S.P. or indigo carmine test is done to determine renal function. Retrograde pyelograms are taken. Urine specimens are obtained from each kidney for culture and a catheter is left in the obstructed side for three or four days, during which time the catheter is irrigated every two hours with 4 or 5 cc. of a 0.8 per cent solution of sulfanilamide in normal saline to maintain catheter drainage.

Under this regime we have never found it necessary to interrupt a pregnancy because of failure of the pyelitis of pregnancy to respond to treatment. However, if such a therapeutic regime should fail, termination of pregnancy must be seriously considered.

TREATMENT DURING LABOR AND THE PUERPERIUM

At the onset labor, all patients with an existing urinary tract infection, or those who have had recurrent antepartum urinary infections, should be placed on or maintained on penicillin or sulfonamide therapy. Following delivery and during the puerperium, the patient should be continued on penicillin or sulfonamide therapy and bladder distention should be combated by the installation of 20-30 cc. of 0.5 per cent mercurochrome

into the bladder shortly after delivery, or if this fails other measures must be instigated. We, at Stanford, have been favorably impressed by the effectiveness of furmethide which increases the bladder muscle tone, and thus overcomes the atony not infrequently seen during the early puerperium. A retension catheter in the bladder may be used as a last resort. At the time of dismissal from the hospital, such patients should be instructed to take 0.25 gm. of sulpathiazole four times daily for one to two weeks for a prophylactic measure.

TERMINATION OF PREGNANCY

In considering the question of termination of pregnancy, the following factors must be carefully evaluated.

1. Failure of the infection to respond to adequate therapy as indicated by persistent high fever, and positive urine cultures.
2. The amount of existing renal damage or the amount of renal damage that can be anticipated if a chronic recurring infection is to be expected.
3. Impairment of renal function as shown by intravenous pyelograms, P.S.P. test, indigo carmine excretion, or elevated blood urea.
4. An acute pyelitis of pregnancy, superimposed upon impaired renal function.
5. Duration of the pregnancy.

Since most pyelitis of pregnancy develops during the second or third trimesters of pregnancy, it will ordinarily be necessary to terminate pregnancy by a vaginal or abdominal hysterotomy. Unless there is evidence of severe renal damage and impairment of renal function, sterilization is not indicated. With the now available sulfonamide and penicillin therapy, and with the recognition of the importance of correcting urinary stasis in pyelitis of pregnancy, the prognosis in general has been greatly improved, and it is rare indeed that termination of pregnancy is indicated.

METHODS OF DELIVERY AT TERM

The importance of maintaining penicillin or chemotherapy during labor and delivery has already been mentioned. Dehydration, which may occur during the course of labor, must be combated by intravenous infusions if necessary. At the time of delivery, bladder trauma should be minimized by the use of caudal analgesia which results in relaxation of the soft tissues of the birth canal, and adequate early episiotomy and forceps should be used to shorten the duration of the second stage of labor.

SEQUELAE AND FURTHER PREGNANCIES

Prior to sulfonamide and penicillin therapy 50 per cent of cases of pyelitis of pregnancy resulted in permanent damage to the urinary tract. The most common sequelae were bacteriuria, pyuria, hydronephrosis, hydronephrosis, ureteral

stricture and the resultant urinary stasis. Less common sequelae were urinary calculi and arterial hypertension. As yet there is insufficient data to indicate whether the high incidence of pathologic sequelae has been reduced by modern penicillin and chemotherapy.

Urine cultures should be taken within four to six weeks after delivery and if bacteriuria is present, penicillin or chemotherapy must be again resorted to and the course of the infection followed by repeated urine cultures. After the infection has been controlled, or if the infection persists in spite of treatment, a complete investigation of the urinary tract should be done. This should include intravenous urograms, cystoscopy, ureteral catheterization and calibration, retrograde urograms and renal function determination. Every effort should be made to clear up all existing pathological lesions as soon as discovered and further pregnancy should be discouraged until the urinary tract is free from infection and anatomically and physiologically normal.

SUMMARY

The physiological changes in the urinary tract during pregnancy are loss of muscle tone, diminution of ureteral peristalsis, ureteral dilatation and hydronephrosis. The result of these changes is stasis, predisposing the upper urinary tract to infection. Pre-existing urinary tract disease increases the possibility of complications during pregnancy.

Preventive therapy is of utmost importance. To date, the most effective bactericidal drugs are penicillin and the sulfonamides. If drug therapy fails, if there is a history of pre-existing renal disease or if the symptomatology is unusual, cystoscopy, retrograde studies, differential cultures, and pyelograms are indicated.

Sterility of the urine must be obtained, and then, if possible, maintained throughout the remainder of gestation, and delivery and the puerperium.

If the infection cannot be brought under control, termination of the pregnancy must be considered.

After delivery persistent infection and residual pathologic lesions of the urinary tract must be eradicated before further pregnancies are undertaken.

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MEDICAL EPONYM

Pellegrini-Stieda-Köhler Disease

Dr. Augusto Pellegrini, while an assistant in Burd's surgical clinic at Florence, described "Ossificazione traumatica del legamento collaterale tibiale dell'articolazione del ginocchio sinistro [Traumatic Ossification of the Ligamentum Collaterale Tibiale of the Left Knee Joint]" in *La Clinica Moderna* (11:433-439, 1905). A portion of the translation follows:

"The ossification that I had the opportunity of studying developed in the ligamentum collaterale tibiale of the knee following an injury. It exhibits many similarities, both in etiology and pathogenesis as well as in its course, to the traumatic ossifications of muscle that are more commonly termed traumatic muscular osteomata. . . ."

Professor Alfred Stieda (b. 1869), of Königsberg, reported "Ueber eine typische Verletzung am unteren Femurende [Concerning Typical Injury at the Lower Extremity of the Femur]" in connection with a demonstration at the Third Congress of the Deutsche Röntgengesellschaft at Berlin in 1907. This report appears in *Archiv für klinische Chirurgie* (85:815-826, 1908). A portion of the translation follows:

"Anyone who works over a rather large number of surgical x-ray films must be struck by the occurrence of a small bone shadow in pictures of knee injuries, which

in dorso-ventral films is typically found on the tibial side, near the transition from diaphysis to internal condyle of the femur. This shadow lies close by the inner condyle of the femur, but is clearly separated from it by a translucent zone.

"The position of the shadow, which is almost exactly similar in all films, is forthright evidence that this is always the same bit of bone, which has been broken off by external force or torn off by the pull of an attached structure, tendon or muscle."

Alban Köhler (b. 1874), of Wiesbaden, in his book *Die normale und pathologische Anatomie des Hüftgelenkes und Oberschenkels in röntgenographischer Darstellung [Normal and Pathological Anatomy of the Hip and Femur as Shown by X-rays]* (Hamburg, 1905), describes Plate vii, Figure 12 (page 140), as follows:

"Ossifications in the region of the knee joint. . . . In the upper part of the external condyle at the juncture with the shaft, in the soft-tissue shadow, [is] a small, smooth, dark shadow . . . that can only be interpreted as an ossification of connective tissue."

This picture of Köhler's is referred to by Stieda in the above-quoted article.—R.W.B. in *The New England Journal of Medicine*.

CALIFORNIA MEDICINE

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EDITORIALS

EDITORIAL ANNOUNCEMENT

WITH this issue the official journal of the California Medical Association takes a new name and enters a new era. Many things about CALIFORNIA MEDICINE besides the name are new. There is a new cover, distinctive for California. There are several new sections. The print used for scientific articles has been increased in size. The arrangement of articles, editorials and official reports has been strikingly altered. And finally, a sincere effort is being made to encourage high scientific standards and to have CALIFORNIA MEDICINE reflect the best of medicine in the State.

Perhaps a little explanation is in order. The *California State Journal of Medicine*, which first appeared in November, 1902, took the place of the annual volume of *Transactions of the Medical Society of the State of California*, first published in 1871; then in turn the name was changed to *California and Western Medicine* in March, 1924, when the journal became the official journal not only of the California Medical Association, but also of the Nevada and Utah Medical Associations.

Now that this publication is the official journal of the California Medical Association only, it is proper that it should bear an appropriate title—CALIFORNIA MEDICINE—this name having been selected by the Executive Committee of the Editorial Board and approved by the Council.

In addition to a much larger section of original and scientific articles, CALIFORNIA MEDICINE will present as in the past, editorials and reports of the official activities of the California Medical Association. New departments will include: (1) a monthly Clinical-Pathological Conference, presenting cases of widespread interest; (2) a Medical Progress department, which will feature authoritative interpretative reviews of the recent developments in a specific field; (3) a Clinical Conference section which will present clinical discussions of cases, with emphasis on therapy;

(4) a section on News and Notes in which will be emphasized events of interest throughout the State; (5) "Letters to the Editor," a section devoted to short comments on happenings of interest to physicians of the State and constructive critical comments on controversial issues; (6) a larger and more prominent Book Review section, presenting reviews which are factual and interpretative and, finally, (7) a section in the lighter vein—Antispasmodics.

To these sections, and particularly to those of News and Notes, Letters to the Editor and Antispasmodics, all members of the California Medical Association are asked to contribute.

Most important, however, is the need for scientific contributions of high order. With a State Medical Association of nearly 8,000, with four and soon five medical schools and with many outstanding physicians, hospitals, research institutes, clinics, universities and governmental institutions and agencies, there is ample good material to more than fill a monthly medical journal the size of CALIFORNIA MEDICINE. The problem is to get it to the editor's desk.

It is hoped that each member of the California Medical Association will take it upon himself personally to see that the best of this material is submitted to CALIFORNIA MEDICINE. The advantages of publishing material in the journal include: presentation to a large audience; appearance in a medical journal of high degree, and prompt publication.

California is growing rapidly. So is the medical profession of the State growing rapidly. It is the hope of the editor that in this journal will be reflected the best of scientific medicine in this period of rapid expansion and sound development. It is further hoped that every member of the California Medical Association will make a sincere effort to aid the Editorial Board of CALIFORNIA MEDICINE in producing a medical journal of which all of us may be proud.

Section of the Vagus Nerves in the Treatment of Peptic Ulcer

EVERY new method postulated for the treatment of peptic ulcer, particularly when it involves a new operation, immediately arouses the skeptics. All too frequently the hopes of countless sufferers from peptic ulcer have been raised temporarily, only to be dashed subsequently in the light of experience. Now comes an entirely new surgical approach to this difficult problem—namely, section of the vagus nerves to the stomach. Because of the relative ease and safety with which the operation can be performed, the absence of significant or severe complications (except immediate acute gastric retention) and the apparent excellent results which have followed it, this new procedure deserves careful consideration.

Dragstedt¹ has pointed out that the excessive secretory response of the gastric glands in ulcer patients to the stimulus of food, and the greatly exaggerated continuous gastric secretion, both of which are probably highly significant in the pathogenesis of ulcer, probably are due to an increased secretory tonus or irritability of the vagus nerves. The presence of gastric secretory and motor fibres in the vagi and the large volume of experimental and clinical evidence indicating the crucial importance of gastric juice in the genesis of ulcer were among the factors which led him and his associates to undertake the procedure of complete vagus section in ulcer patients.

What are the results? In an excellent symposium on this subject at a recent meeting of the American Gastro-Enterological Association, there were reports of good results of the operation from three medical centers. Palmer², reporting on 73 cases operated upon by Dragstedt and his associates at the University of Chicago, noted no failures to relieve ulcer symptoms or to heal the ulcer. The longest interval was three years. Ruffin³ of Duke University reported that Grimson in his series of 30 cases had excellent results with immediate and complete relief of pain. Chester Jones⁴ of the Massachusetts General Hospital noted that in 30 cases (one-third jejunal ulcers and two-thirds intractable duodenal ulcers) there was healing of the ulcers, relief of symptoms and no recurrence in a two-year period. These results sound fantastic, but it should be recalled that they were reported by medical men and not by surgeons and that all of the men reporting them are distinguished and conservative gastroenterologists.

How does the operation work? Is it the effect of decreased gastric secretion? Is decreased gastric motility a significant factor? Is the section of sensory nerve fibres carrying pain impulses in the vagus nerves a factor? The answers to these questions are not clear, but it appears that there are striking decreases in motor activity of the stomach postoperatively, and that the cephalic

phase of the gastric secretion is abolished if the vagotomy is complete. While the latter fact doesn't alter the response of the gastric mucosa to stimulation with histamine, it does reduce the volumes of night secretion of gastric juice in patients with ulcer.

Are there any complications? Dragstedt has pointed out that intercostal pain persisting for several weeks and probably due to the trauma of thoracotomy is the most annoying complication. Another significant one is disturbance of gastric motility, which occurs immediately in some patients and has occasionally produced gastric atony and dilatation of such degree as to warrant pyloroplasty or a short-circuiting operation. Patients often have fullness after meals for some months postoperatively, there may be mild diarrhea and constipation is usually cured.

Upon what types of ulcer patients should the operation be attempted? It is almost universally agreed that patients with intractable duodenal ulcers and those with recurring marginal (jejunal) ulcers are best suited for this operation. Until more experience has been gained, it would appear wise not to use the operation routinely for the treatment of ulcer. Psychoneurotic patients have not been relieved of their symptoms by this operative method.

Naturally all the problems raised by this discussion cannot be answered. Some surgeons are of the opinion that the operation should be done in association with gastric resection, under which circumstances the vagotomy is done infra-diaphragmatically, achlorhydria often is attained and the possibility of serious gastric dilatation avoided. Other surgeons consider that the supra-diaphragmatic approach is essential if one is to completely divide all the fibres of the vagus nerves. In this connection, Hollander⁵ has shown that if all of the vagus fibres are sectioned, the insulin test will reveal absence of any cephalic phase of gastric secretion.

Naturally, the results of this procedure in the face of the experiences just mentioned, look extremely hopeful. Healthy conservatism is justified, however, until experiences with it are wider and have existed longer. But, for those unfortunate victims of intractable ulcers, and particularly those with recurrent postoperative bleeding and painful ulcers, there is again new hope on the horizon.

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MEDICINE ON THE AIR

For the first time in its history the California Medical Association has gone into radio. The "California Caravan" series has already made an auspicious start and is planned to continue for fifty-two weeks.

Comment from outside the medical profession attests the wisdom of such a program. For one thing, the old shackles of "no advertising" by the medical profession have been broken; the ban on advertising by individuals is not affected by this decision, but the joint effort of all members in the C.M.A. in sponsoring a commercial radio program of a kind generally favored by doctors of medicine has met with a cheer from many members of the association, public relations officials, newspaper publishers and radio station operators alike. The newspapers of California are already on the C.M.A. schedule for space to advertise the Voluntary Health Insurance Weeks throughout the State; the addition of a radio program proves that the C.M.A. means business in boosting the voluntary forms of sickness insurance.

"California Caravan" was selected as the Association's radio expression on the basis of numerous factors. Among them were the entertainment value of a dramatized program which bids

for audience attention from all age groups, the possibility of honoring numerous localities by reenacting scenes from the history of the various areas of a large state, and the availability of a wealth of historical material from which to draw.

In the weeks to come this program will shift its locale from one area to another. The antiquity of San Diego was honored in the initial broadcast; there remain all the mountain, valley and coastal regions, all rich with historical lore and many of them with no previous coverage on programs of this character. Your own county or your own community will be the scene of one of these programs.

For enjoyable entertainment, we recommend "California Caravan." For public service we likewise recommend it. The ultimate appraisal will come, of course, from the public. In the months to come the listening habits of the public will determine the real value of this approach to public relations; the planning of the program has this one objective in mind. The problem is to gain an audience; the objective is to tell a suitable story in an interesting fashion and thus to let the public in on our planning for the spread of voluntary prepaid medical services. We believe "California Caravan" is among the answers.

Clinical-Pathological Conference

PRESENTATION OF CASE*

G. M. A 43-year-old white female, native of Tennessee and a long-time habitue of the Los Angeles County Hospital because of diabetic problems, entered the hospital on October 5, 1939, with the following complaints: (1) aching "from head to foot"; (2) chills and fever. The chills and fever usually occurred at night, at which time the temperature would rise to 100 or 101 F. Her diabetes had been well controlled since her last entry to the hospital in August, 1939.

Physical Examination: Temperature was 99.4; pulse, 100; respiration, 24; blood pressure, 140/78. The patient was very obese, did not appear acutely ill, and there were no positive findings on examination of the abdomen and thorax. Although she complained once of having a chill, this was not observed by any of the staff.

Laboratory Examination: Carbon dioxide combining power was 52 volumes per cent. Blood Wassermann was negative. Blood sugar varied between 182 and 220 mg. per 100 cc. blood.

The diabetes was well controlled on 30-40-30 units of regular insulin. The patient left the hospital after four days.

Past History: Previous to her entry with chills and fever on October 5, 1939, the patient had been in the county hospital many times beginning in 1936 because of

diabetes and various complications such as abscesses, carbuncles, pyelitis, and dental caries. The patient had been a concert singer and had traveled widely in the United States and Europe. For a period from 1933 to 1935 she had been a drug addict.

Subsequent Course.

October 18th: The patient returned to the hospital because of nausea and pain in the upper abdomen. The pain in the upper abdomen was colicky in type and radiated through to the back. There was no vomiting or jaundice. The fever and chills had continued. On this entry the temperature varied between 100 and 104 for six days, then came down to between 98.6 and 99.6.

On physical examination there was tenderness and a palpable mass in the right upper quadrant. The size and shape of the mass were difficult to determine because of the patient's obesity. No findings were noted elsewhere.

The laboratory findings included a cholecystogram, which failed to show any dye concentration in the gall bladder. X-ray of the chest showed bilateral elevation of the diaphragm and diffuse thickening of both lungs, suggestive of bronchopneumonia. In spite of the high diaphragm, the lower border of the liver was noted to be quite low on the x-ray. Agglutination tests for typhoid, tularemia, and Brucella were negative. The icterus index was 7. Repeated leukocyte counts were done, which varied between 6,300 and 7,000, with polys 60 to 66 per cent.

Gall bladder surgery was advised. The patient refused and left the hospital on October 28th.

* Taken from the Clinical-Pathological Conference, Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

November 11th: Patient returned to the hospital because of the same symptoms except, in addition, there was pain over the urinary bladder and frequency of urination. On examination the urine contained many pus cells and bacteria. This was treated and controlled with urinary antiseptics. At this time a definitely enlarged liver was palpated on physical examination. The right upper quadrant tenderness had persisted. The white blood count was 4,150 with 78 per cent polys. Hemoglobin was 90 per cent. The patient left the hospital on December 7th. During the entire stay there was a daily fever varying from 99 to 101.

December 16th: The patient returned again in the same condition except that she had begun to vomit occasionally. The leukocyte count remained around 5,200. Icterus index was 6. Nonprotein nitrogen was 37. Blood amylase was normal. Nothing was noted on retrograde pyelograms. A barium meal revealed no changes in the stomach. There was still bilateral thickening of the bronchovascular tree on fluoroscopy. The electrocardiogram showed a sinus tachycardia. The diabetes was well controlled.

February 18, 1940: The last entry was on February 18, 1940, at which time she complained of accentuation of her former symptoms. On examination at this time she appeared to be in acute distress. There was considerable cough but no rales were heard in the chest. The liver was enormously enlarged, down to the iliac crest, and tender. Likewise the spleen was now palpable. There was no evidence of ascites. The blood pressure was rather changeable. It would be as high as 180/100 one day and 110/70 the next.

Laboratory findings included a white blood count of 8,500 with 64 per cent polys and a red blood count of 4,900,000. Serum albumin was 2.7, serum globulin 2.3 gm. per 100 cc. of blood, and serum cholesterol was 217. The temperature would swing from 98.6 to 102. The patient was considered to have gall bladder disease and on February 22nd she was operated upon but expired in surgery.

H. E.

DISCUSSION BY CLINICIAN

DR. VERNE MASON*: The history may be denuded to its bare essentials as follows:

In October, 1939, the patient complained of chills and fever and at night her temperature went to 100 or 101°. Nothing significant was made out on examination. Soon she had colicky pain in the upper right quadrant associated with chills and fever. A mass, probably the liver, was felt in the right upper quadrant. There was never jaundice.

November 11, 1939—there were fever and chills and the liver was larger. The WBC count was 4,150.

December 16, 1939—same fever.

February 18, 1940—fever continued; pain in the right upper quadrant, with fever 99 to 102. Liver very large. Spleen now palpable (patient very obese).

Patient died during operation for gall bladder disease.

Reduced to simpler terms, this patient had a sub-acute febrile disease associated with severe pain in the upper abdomen and enlargement of liver and spleen with leukopenia but without jaundice.

The diagnosis, or at least a good guess, must be made by exclusion since nothing in the history or examinations makes a positive diagnosis. I shall exclude a few common conditions.

1. Cirrhosis either of Laennec's or Hanot's type is excluded.

2. Gall bladder disease and its complications are excluded.

3. Amyloidosis is excluded.

4. Pylephlebitis is probably excluded.

We are left with the following possibilities:

A. She had a metastatic carcinoma of the spleen and liver. It is a rather rare occurrence.

B. She may have had lymphoma with or without leucemia.

C. She may very well have had Hodgkin's disease.

D. She may have had tuberculosis of the liver and spleen. Tuberculosis of the liver is an excessively rare disease to have, but tuberculosis of the spleen is not so rare; but to have it in both would be almost out of the question, so one could practically exclude that.

E. She could have had granuloma of the liver and spleen.

F. She might have had a primary carcinoma of the liver with cirrhosis. That is not an unusual event.

G. She might possibly have had periarteritis nodosa.

You can go on from there as far as you want and probably name others.

There are other methods of approaching this history. The history was written by an individual who knew the diagnosis. He stressed the point that the patient was a native of Tennessee and had traveled widely, which may be of importance. He repeated that the diabetes was under control. He did not state what was found in gall bladder and I assume nothing was found.

Either the patient had a very rare disease or a common disease with unusual manifestations. I assume the disease was rare. He stated that the blood pressure fluctuated. Therefore, by means other than scientific one would guess the patient had some disease affecting spleen, liver and adrenal.

Of those, there are two that are possible. One would be a hypernephroma, and the other would be some fungus infection, some granuloma of the liver and spleen. Since the patient was a native of Tennessee—that was so distinctly stated—I take it for granted this patient had probably histoplasmosis.

Now, the confession I have to make. I arrived at this conclusion after studying this case. Then it suddenly dawned on me that this history sounded familiar, and I had known the history before. Also, about that time some one of my friends came along who had read this history and said he knew what the patient had, and gave me her history. It had been published in the *Journal of Pathology*. So, I am perfectly willing to make the confession that I know what this person had. I didn't say anything about it and let it go on at this time because of the tremendous interest that there is in this disease.

DISCUSSION BY PATHOLOGIST

HUGH EDMONDSON**: I did my best to get a case for Dr. Mason. I asked many of the residents for the past several years if he had seen this case, and only yesterday one of them said that he thought Dr. Mason had seen it.

I believe the credit for the correct diagnosis in this case belongs to Dr. Walter Martin, one of our residents, who took the trouble to go down to the Coroner's office and get the sections for further study.

The patient had a liver which weighed thirty-four hundred grams, very finely pitted in appearance. The spleen weighed thirteen hundred grams. The lungs were heavy and soggy. No weight was given, nor was anything said about any nodular areas being present in the

* Clinical Professor of Medicine, University of Southern California School of Medicine.

** Assistant Professor of Pathology, University of Southern California School of Medicine.

lungs. The adrenals were enlarged. So then, the lesions were principally in the liver, spleen, lymph nodes and adrenals. There was nothing of note in the kidneys. The gall bladder was smooth and normal in appearance.

Study of the microscopic sections was necessary to make the final diagnosis. Lesions were present in the liver, spleen, lymph nodes, and adrenals.

There were these [slide] small lesions in the liver in which reticulo-endothelial cells containing the organism of histoplasma capsulations are seen.

In the lungs there were lesions which were a little larger [slide].

These [slide] are some pictures published several years ago at Duke University showing the size of the organisms. They circulate in the blood in both monocytes and the polymorphonuclear leucocytes.

You might ask why we pick such a rare case as this. Perhaps just a few words would be in order. This disease was first described by Samuel Darling in 1906. He noted three cases in the Panama Canal Zone. He thought the disease was due to a protozoon. He found the organisms. However, it was about twenty-five years before the correct diagnosis was made as to the type of organisms. This diagnosis was made by De Monbreu who finally established that it was a fungus.

As far as is known, it is the only type of fungus infection in the body that lives in this particular form. They are practically never to be found outside of the cells. Naturally, it is something like a virus. The organisms are easily cultured. They grow in a vegetative form only at room temperature and have a yeast-like appearance.

It is not known how they occur in nature in their vegetative form, as they have not been observed. They have been noted in several autopsies on dogs. It is postulated that that may be how children get the infection.

The disease was thought to be a rare one until about 1938 and I will cite you some reports. The first of these was at the University of Michigan by Parsons who reported six fatal instances of the disease. There have been other instances reported by pathologists in that state. The next piece of work was done by Palmer, from the United States Public Health Service, in regard to the question of calcification in the lungs of individuals.

The first series was that of 235 student nurses principally in the Eastern part of the United States. Sixty-seven per cent of these student nurses had a negative tuberculin and a positive histoplasmin test.

The next publication of interest came out last year by

Dr. Emmons, also of the United States Public Health Service.

The last publication is also by Palmer, who took ten thousand student nurses all over the United States and he gives the geographical distribution of those individuals who are sensitive to histoplasmin.

This [slide] just shows the way the organism grows on culture.

Here [slide] is a slide made of Palmer's most recent work which came out in April of this year. You can see the percentages here of the various parts of the United States, particularly in the upper Mississippi Valley. Sixty-eight per cent of the nurses tested had a positive test. We have various degrees of positive reaction throughout the remainder of the United States—20 per cent in Texas, 68 per cent in Tennessee.

As you get away from the humid areas toward the more airy parts of the country, the histoplasmin fell off almost to zero.

DR. McCLENDON: Being among the audience and reading this proctol over, I am not satisfied that I would think of all the things Dr. Mason thought of in reading the proctol. How could you come to any conclusion about what to do in order to reveal the diagnosis in this case. Since Dr. Mason has been on both sides, I am going to ask him to make a comment because I think everyone should read this with the idea of what he would do if he were to encounter a call like this again.

DR. MASON: I can remember seeing this patient before. The history is not a very good history from a clinical standpoint because there were certain things about this patient that were so unusual, and you rarely see it. This patient complained constantly and bitterly of tremendous pain not only in her right upper quadrant but in her upper left. After admission to the hospital she was continuously having tremendous pain in the area of the liver and spleen and there was never any letup in these symptoms. At the time I saw the patient at the Clinic of Pathology at the County Hospital that set of symptoms was so unusual that we were sure that this patient had some disease we had never seen before. Large liver, large spleen, enormous fluctuation of the blood pressure, chills and fever and constant continuous pain in both upper quadrants led us to believe it was something we had never seen before, and we guessed it might have been a granuloma. It was only a guess. A few weeks later we made a much better diagnosis by getting a piece of liver and found the organisms in the liver.

I have a patient with the same series of complaints, and enormous pain in liver and spleen and fever, and this has been going on for a long period of time.

Clinical Conference

FROM STANFORD UNIVERSITY HOSPITAL—FRIDAY STAFF ROUNDS

BLEEDING PEPTIC ULCER

DR. A. L. BLOOMFIELD*: We have today a patient with long standing stomach trouble who presents some difficult problems in therapy. Dr. Weed, will you give the history.

PRESENTATION OF THE CASE by the Interne, Dr. Charles Weed:

This 56-year-old electrician first entered Stanford Hospital in 1935 with the complaint of bleeding duodenal ulcer for nine years. There was no history of similar trouble in the family. He had always been tense and

nervous. He had worked hard as a telephone lineman in the past but for some time had confined himself to fairly easy indoor work as an electrician. Since 1923 he had had indigestion with post prandial pain relieved by food and alkali. Duodenal ulcer was diagnosed in 1927. In 1933 he had an acute perforation which was operated upon elsewhere. From 1933 to 1935 there had been frequent bleeding. His first entry was for tarry stools and bloody vomitus. Nothing remarkable was made out on physical examination at that time except pallor. His hemoglobin had fallen to 52 per cent. Gastric analysis showed a total acidity of 130 after histamine with large volumes of secretion. X-ray films showed

* Professor of Medicine, Stanford University School of Medicine.

a small deformed duodenal cap with moderate six-hour retention. In spite of restriction of activity, careful diet and antispasmodics there was almost continuous bleeding during the ensuing year. In October, 1935, operation was done by Dr. Holman. An ulcer of the first portion of the duodenum and a duodenal diverticulum were excised; adhesions were freed and a Finney pyloroplasty was done. He was comfortable at first but within a few weeks after operation was bleeding again. In March and June, 1936, he had large hemorrhages which required transfusions. At the same time he had bouts of severe upper abdominal pain to which he referred as spasms. These were often, but not always, related to meals. The same general situation has continued up to the present entry, namely frequent bleedings and frequent bouts of indigestion and cramps. He has taken good care of himself and has eaten a simple diet avoiding coarse, greasy and highly seasoned foods. He has tried all the medicines. He has limited his work to eliminate exercise and fatigue. There are no obvious psychogenic factors.

He reenters now (June 7, 1946) with much the same complaints. Yesterday he suffered an attack of cramps and at 3 p.m. passed a large tarry stool. On examination he appeared anxious and restless. Otherwise physical examination was not remarkable. His hemoglobin is 65 per cent and his red cell count is 3 million. He passed two more bloody stools last night. We have made no x-rays yet because of his condition, but on his recent entry in December, 1945, the deformity of the duodenal cap was noted. The stoma was patent and there was no six-hour residue.

In summary, a 56-year-old man who for 23 years has had persistent bouts of indigestion and epigastric cramps, with x-ray evidence of duodenal ulcer and duodenitis. He has bled on numerous occasions, many of the hemorrhages being of sufficient size to reduce his hemoglobin to 50 per cent or lower. He promptly bled again after operation at which presumably all open lesions were removed. He has had thorough medical treatment consisting of periods of rest, careful diet, antispasmodics, sedatives and alkalis. The environmental and emotional aspects of his case have been thoroughly studied. In spite of all this, bleeding and indigestion continue.

DR. BLOOMFIELD: I am sure you are all impressed by the extraordinary amount of trouble this patient has had over many years. He is an intelligent man and has learned practically all there is to know about the management of peptic ulcer. He has taken good care of himself, but in spite of this he continues to have frequent hemorrhages as well as bouts of cramps and indigestion. It is cases of this sort that force one to the conclusion that there is a constitutional element in many people with this sort of trouble. Attempts have been made by Wolff, Draper and others to define both the physical and mental pattern of those who are subject to peptic ulcer; but in this patient, so far at least, nothing definite has been made out. Dr. Whitsell and Dr. Lion are making a comprehensive study of this whole subject now and are hoping to find out by elaborate studies and psychometric tests just what the emotional fault, if any, is to be found in people with this sort of trouble. At any rate we have no practical lead to treatment along psychiatric lines in the present patient, although he is of course nervous and disturbed *as a result of his trouble*.

What are we going to do for him then? To make the best decision I think we must be clear about the pathology of his condition. Whatever the ultimate cause may be, here is a man who for some reason secretes an abundant, highly acid gastric juice, whose pyloric region tends to go into spasm with consequent symptoms of indigestion and whose duodenal mucosa tends to break

down with ulcer formation. After years of this we certainly have chronic scarring of the duodenum and whether the mucosa happens to be eroded at any particular moment is perhaps relatively unimportant except for the hazards of hemorrhage and perforation. I think doctors often lay too much stress on evidence of actual ulcer; even when the open lesion heals, the disease is still present in the form of duodenitis, and both symptoms and ulceration are likely to recur.

Two things, then, are quite clear here. First it is extremely improbable that this scarred and deformed duodenum can be healed by diet or by drugs. All that has been thoroughly tried for years and he continues to have severe trouble. Also, regardless of whether there has been any psychological cause in the past, the organic changes are now clearly beyond the help of psychotherapy. If one is disposed to look on peptic ulcer as a psychosomatic disease, we would weight the somatic part as being perhaps 95 per cent important in this man at the present time. Secondly, he is constantly at risk from hemorrhage. As you have heard, he has nearly bled to death in the past and on one occasion was brought back by intracardiac injections of adrenalin. At his age, 58, the hazard of erosion of a calcified vessel which can not retract normally so as to stop the bleeding is very high. All this forces us to the reluctant conclusion that in spite of his already having had two operations some surgical procedure must again be undertaken. I want Dr. Holman, who did the previous operation, to discuss this question and tell us what he advises, but I think at this time we should also touch on the question of resection of the vagus nerves in the treatment of peptic ulcer. This is not a new idea, but recently, especially as a result of the work of Dragstedt and others, there has been a big revival of interest in procedures of this sort. Very briefly, vagal action stimulates gastric secretion and promotes spasm and motility of the gastro-intestinal tract. You are all familiar with the cramps which may follow an injection of mecholyl, a drug which stimulates the parasympathetic. It is also common knowledge that large doses of atropin greatly decrease the amount of gastric secretion and to some extent the degree of acidity and motility and might relieve symptoms in patients with duodenitis especially by relaxing spasm. There is an interesting recent report from the Massachusetts General Hospital giving careful studies of the clinical and physiological effects of transdiaphragmatic section of the vagi in peptic ulcer. The Boston workers feel that the procedure is especially indicated in young or middle-aged patients with intractable symptoms, perhaps with hemorrhage at some time, but without obstruction or evidence of extreme anatomical change. In many such patients symptoms were promptly relieved and there was evidence of rapid healing of the ulcer. One difficulty which may be mentioned is that when the nerves to the stomach are interfered with the initial alterations in motility and secretion may later subside; the effect may not be permanent. It is clear then that long follow-up periods are necessary to evaluate the real end results of vagal section. At any rate we now want Dr. Holman's opinion as to what sort of surgical procedure he advises here.

DR. EMILE HOLMAN**: The history of repeated episodes of gastrointestinal bleeding from a presumed peptic ulcer provides a positive indication for operation which preferably should attack the bleeding site. This one should be freed from surrounding tissues and structures in order that the bleeding vessel may be ligated. This patient is at the age when bleeding is due to erosion

** Professor of Surgery, Stanford University School of Medicine.

of a sclerotic vessel, and as it can so easily be fatal, it is imperative that the operation be done at this time despite apparent cessation of bleeding. It would be highly desirable to know the degree of acidity present as this often determines the type of operation to be performed. As I recall it, this patient had a high acidity preceding his operation in 1935.

INTERNE: That is correct.

DR. HOLMAN: In addition to a direct attack upon the bleeding vessel, the presence of a high acidity would call for resection of two-thirds to four-fifths of the stomach. Wangenstein has demonstrated conclusively the importance of acidity in the production of ulcer, and he insists upon the necessity of reducing acidity as the most important part of any surgical therapy for ulcer. In this patient, who has already had an operation for perforation and a second plastic operation upon the pylorus, a definite attack upon acidity is indicated.

I recently attended a meeting before which Lester Dragstedt presented his experiences with bilateral vagus section for 82 intractable ulcers referred to the surgeons following failure of medical treatment. Perhaps we should consider this operation for this patient. Dragstedt considers vagus section particularly indicated where reduction in acidity is desired. Experimentally, he has shown that the isolated stomach with vagi intact yielded 1,100 cc. of gastric juice with an acidity of 116. Following vagus section the same isolated stomach produced only 44 cc. of juice with an acidity of 30. In his 82 cases performed over a period of three and a half years, there was relief of symptoms in each instance and control of bleeding in a few. Even nine marginal ulcers following gastroenterostomy were improved by vagus section.

The operation for vagus section is performed through a thoracotomy preferably, but may also be performed transabdominally, should local exploration of the lesion seem desirable. I believe in this instance the abdomen should be opened, the lesion attacked directly, with a vagotomy as well. Several estimations of gastric acidity

now would be interesting to compare with similar studies following vagotomy.

A VISITOR: What about the medical treatment of bleeding peptic ulcer?

DR. BLOOMFELD: The first decision is whether medical treatment is safe or whether operation is necessary. I know of no formula whereby this decision can be made. In people over 45 or 50 years old who may have intractable bleeding from a sclerotic artery in the base of the ulcer, one should probably operate if loss of blood is large and persistent and if transfusion cannot readily keep pace with the blood loss. The availability of concentrated red cell "mush" may sway the decision, as one gets approximately twice the effect with this as one does from whole blood transfusion. As for medical treatment, we used to fast these patients for from three to seven days after a big bleeding. The idea was to rest the stomach and allow the lesion to heal. In recent years the pendulum, following Meulengracht and others, has swung to the other extreme and fairly liberal feedings beginning even while bleeding may still be in progress have been advised. The argument is that the stomach may as well be full of food as full of blood, that feeding promotes healing of ulcer and that in general the results are better. Our own experience with immediate liberal feeding has been definitely unsatisfactory; bleeding and pain have often continued and later on fasting had to be resorted to anyway. As in all such matters there is probably a sound middle ground and at present we are inclined to have our patients fast for a day or two following a bleeding; then, if all is going well, to give them small feedings of milk and cream for another day or two; following which they may go on a simple mixed diet. Transfusions are used freely if the bleeding is of any great degree. However, no general rule can be rigidly followed in the individual case.

DR. F. L. REICHERT: Well, whatever you do, you have to go on teaching these patients. Teaching, teaching! Telling them to go slow and not get excited, not work too hard. That's the important thing.

Samuel Taylor Coleridge (1772-1834).—If Coleridge had not had a singular fondness for browsing through a neighbor's medical periodicals, he might never have known opium. As it was, he read of the Kendall Black Drop at a time when he had been bedridden with a severe

rheumatic affection. The remedy freed him from his pains, but addicted him to the drug. Some critics aver that the effect of this drug stimulation pervades all his poetry. Certain it seems that *Kubla Khan* is a recorded opium dream, left unfinished upon awakening.—Warner's *Calendar of Medical History*.



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FOR COMPLETE ROSTER OF OFFICERS, SEE ADVERTISING PAGE 2

NOTICES AND REPORTS

EXECUTIVE COMMITTEE

Minutes of the 198th Meeting of the Executive Committee of the California Medical Association.

The meeting was called to order by President-Elect John W. Cline in the Hotel St. Francis, at 9:30 a.m., June 29, 1946. Present were: Sam J. McClendon, President; John W. Cline, President-Elect; Edwin L. Bruck, Chairman of the Council; E. Vincent Askey, Speaker of the House of Delegates; Sidney J. Shipman, Chairman of the Auditing Committee; Dwight L. Wilbur, Editor, and L. Henry Garland, Secretary. Present by invitation were Lyell C. Kinney, Chairman of the Cancer Commission; Mr. Ben H. Read, Mr. Howard Hassard and Mr. John Hunton.

Also present were Doctors Robertson Ward, John W. Green, H. Gordon MacLean, Lowell S. Goin, C.M.A. Delegates to the A.M.A.

On nomination duly made and seconded, Sidney J. Shipman was elected chairman of the Executive Committee and assumed the chair.

Retired membership applications from the following were approved:

Johnstone, Kristine B., Napa County.

Langstroth, Lovell, San Francisco County.

Preston, Addison W., Tulare County.

Nominations for the election of Irving D. Johnson, Katherine Thomas, Andrew M. Harvey, and Jessie M. Bierman were approved for election to Associate Membership in the California Medical Association.

The question of an associate member serving as secretary of one of the scientific sections was raised and legal counsel was instructed to determine from the Constitution and By-Laws whether the holding of a scientific section office by an associate member would constitute a breach of the Constitution and By-Laws.

The resignation of Roy E. Thomas of Los Angeles as a member of the Standing Committee on Hospitals, Dispensaries and Clinics was accepted, the Chairman of the Council being authorized to name a successor.

The Taft Bill (S. 2143) was discussed and it was voted to forward to Senator Taft some suggested amendments which would first have been cleared through consultation with the Council on Medical Service and Public Relations of the American Medical Association.

On request of the Board of Trustees of California Physicians' Service, and on motion duly made and seconded, the chairman of the Council was authorized to appoint a fee schedule committee to draw up a table of professional fees for use by California Physicians' Service.

On request of the Board of Trustees of C.P.S. and in conformity with a recommendation by the Chandler Committee for the Study of Prepayment Medical Care, it was moved, seconded and voted that the C.M.A.

appropriate up to \$5,000 for the purpose of securing a survey of the business methods and actuarial status of California Physicians' Service. A committee consisting of the chairman of the Council, Legal Counsel, Public Relations consultant, Executive Secretary and Mr. C. Ray Miller, lay member of the Board of Trustees of C.P.S., was authorized to investigate professional firms capable of making such a survey, a report of such investigation to be presented for the consideration of the Council at its next meeting.

Doctor Lyell Kinney, Chairman of the Cancer Commission, reported on the status of the Commission's activities and on behalf of the Cancer Commission requested (1) that the President of the California Medical Association be authorized to name eight or nine additional medical specialists as members of an advisory committee of the Cancer Commission and (2) that the Cancer Commission be authorized to employ an executive secretary, a part of whose salary would be paid by the C.M.A. and the balance of the salary, plus expenses, to be paid by the California Division of the American Cancer Society.

On motion duly made and seconded, the President of the California Medical Association was authorized to name additional members to the Cancer Commission.

On motion duly made and seconded, it was voted to approve the employment of an executive secretary by the Cancer Commission, with an appropriation by the C.M.A. of \$3,000 annually toward the salary of the executive secretary, it being understood that the California Division of the American Cancer Society would appropriate \$9,000 annually for the balance of the salary and such amount as might be needed for the expenses of such executive secretary.

SIDNEY J. SHIPMAN, M.D.,
Chairman.

L. HENRY GARLAND, M.D.,
Secretary.

CALIFORNIA PHYSICIANS' SERVICE

REPORT OF ANNUAL MEETING OF ADMINISTRATIVE MEMBERS

Pursuant to Section I of Chapter V of the by-laws, a regular annual meeting of Administrative Members of California Physicians' Service, a California non-profit corporation, was held at the Biltmore Hotel, Los Angeles, California, on Tuesday, the 7th day of May, 1947, at the hour of 8:30 p.m.

A quorum was present and acting, viz, 184 administrative members of a total administrative membership of 239, including administrative members at large, officers of the California Medical Association and regularly

elected and seated delegates and alternates to the House of Delegates of the C.M.A. The roll call of the House of Delegates was accepted as the roll call of Administrative Members.

Dr. Lowell Goin, president of the corporation, acted as chairman of the meeting, and Dr. Chester L. Cooley, secretary of the corporation, acted as secretary thereof.

The minutes of the annual meeting of 1945 were approved as published.

Dr. Goin spoke briefly concerning the recent hearings before the Pepper Committee, stating that there were only two choices open to the profession—voluntary health insurance or government controlled health insurance. If the doctors will not actively support the voluntary system, then the government will step in.

The president then appointed a nominating committee, consisting of Dr. Donald Cass of Los Angeles (chairman), Dr. Sidney Shipman of San Francisco and Dr. H. A. Randel of Fresno, to select nominees for the four vacancies on the board of trustees. The terms of the following trustees expire at this annual meeting: Dr. Chester L. Cooley of San Francisco, Dr. A. E. Moore of San Diego and Msgr. Thomas J. O'Dwyer of Los Angeles. These are three-year terms expiring at the annual meeting in 1949. There is also a vacancy resulting from the resignation of Dr. T. Henshaw Kelly, whose term expires in 1948.

Dr. Goin then appointed a resolutions committee, consisting of Dr. Dewey R. Powell of Stockton (chairman), Dr. Donald A. Charnock of Los Angeles and Dr. John Sharp of Salinas, to receive, consider and report, favorably or unfavorably or without recommendation, any resolutions offered, or to offer amendments or substitute resolutions.

Dr. Cooley, Secretary of California Physicians' Service, presented the annual report of the trustees to the Administrative Members, and Mr. W. M. Bowman, Executive Director of C.P.S., presented the business report. The president then referred both the report of Dr. Cooley, as secretary, and the report of Mr. Bowman, as executive director, to the Resolutions Committee.

Dr. Goin then pointed out that any action taken by the House of Delegates of the C.M.A. concerning C.P.S. would have no binding effect on the Administrative Members, and that any action taken by the House of Delegates would have to be confirmed by the Administrative Members.

There being no further business until the completion of the reports of the Resolutions and Nominating Committees, the meeting recessed, to meet Thursday evening, May 9, 1946, at the same time and place, to carry forward the election of trustees and to deal with any resolutions handed to that committee.

At the conclusion of the recess, the annual meeting of Administrative Members reconvened, at the hour of 10:05 P.M., on Thursday, the 9th day of May, 1946.

A quorum was present and acting, viz., 202 administrative members of a total administrative membership of 239, including administrative members at large, officers of the C.M.A. and regularly elected and seated delegates and alternates to the House of Delegates of the C.M.A. The roll call of the House of Delegates was accepted as the official roll call of Administrative Members.

Dr. Lowell Goin, president of the corporation, acted as chairman of the meeting, and Dr. Chester L. Cooley, secretary of the corporation, acted as secretary thereof.

Dr. Donald Cass, reporting for the Nominating Committee, stated that for the three vacancies on the Board of Trustees for full terms of three years each, expiring

in 1949, Dr. Chester L. Cooley, Dr. A. E. Moore and Msgr. Thomas J. O'Dwyer had been nominated to succeed themselves.

To fill the vacancy of the unexpired term resulting from Dr. Kelly's resignation, which term expires in 1948, Dr. Robertson Ward of San Francisco was nominated.

It was moved, seconded and unanimously carried that the above nominees be elected to serve as trustees for the terms specified.

Dr. Dewey Powell, chairman of the Resolutions Committee, stated that no resolutions had been presented to that committee, and congratulated the trustees and the administration on the fine work that has been done during the past year. Dr. Powell stated that he had not been connected with C.P.S. for the past two years and was amazed at the progress that the organization has made during this period; that it has grown tremendously, and that it is still carrying out the ideas of the first administrative members and the board of trustees in developing a high quality of prepaid medical care for the people of California.

Dr. Powell then recommended that the reports of the secretary and executive director be approved. A motion was duly made, seconded and carried, and said reports were approved.

The president then stated that the House of Delegates of the California Medical Association had forwarded to this corporation a copy of the final action of the House of Delegates on the Report of the C.M.A. Committee on Prepaid Medical and Hospital Care Plans.

On motion duly made, seconded and unanimously carried, the recommendations contained in the report of the C.M.A. Committee on Prepaid Medical and Hospital Care Plans were referred to the Board of Trustees of C.P.S. for such action thereon as the board, in its judgment, may determine.

The president pointed out that one of the recommendations contained in the report of the C.M.A. Committee on Prepaid Medical and Hospital Care Plans required the increase of the number of trustees of the corporation from eleven to fifteen, and that such increase necessitated a by-law amendment adopted by a majority of all of the administrative members. Thereupon, on motion duly made, seconded and unanimously carried it was

Resolved, That Section 1 of Chapter VI of the by-laws of this corporation, California Physicians' Service, is hereby amended to read as follows:

Sec. 1. Corporate Powers Vested in Board of Trustees: The corporate powers of this corporation shall be vested in a board of fifteen (15) trustees and six (6) trustees shall constitute a quorum for the transaction of business. Trustees may be administrative, professional or beneficiary members of the corporation. The board of trustees, by the affirmative vote of two-thirds (2/3) of all of the trustees, may delegate to any committee of not less than three (3), the members of which need not be trustees but must be administrative or professional members, any specific portion or part of the corporate powers of this corporation.

There were more than a majority of all of the administrative members present, and the president announced that the foregoing resolution had been adopted by the affirmative vote of a majority of all of the administrative members.

There being no further business to come before the meeting, the meeting adjourned at 10:30 P.M.

CHESTER L. COOLEY, M.D., *Secretary*.

CHANGES IN MEMBERSHIP

New Members (122)

*Alameda County (1)*Wiesenfeld, I. H., *Oakland**Fresno County (1)*Kasper, Raymond J., *Fresno**Kern County (2)*Burnett, R. W., *Bakersfield*.Ramirez, Hall, *Bakersfield*.*Los Angeles County (84)*Abdo, Francis J., *Los Angeles*Agin, Jacob, *Hollywood*Agress, Clarence M., *Los Angeles*Bachhuber, Robert G., *Los Angeles*Baker, Robert V., *Camarillo*Bergman, Macks Leonard, *Los Angeles*Blankfort, Gerald, *Los Angeles*Braslow, Edithmae T., *Avalon*Braslow, Lawrence, *Avalon*Buch, Irwin M., *Los Angeles*Buchler, George S., *Whittier*Britton, James Howe, *Altadena*Bushnell, Lowell F., *Los Angeles*Cane, Edward M., *Los Angeles*Caraco, Henry H., *Long Beach*Cohen, Seymour R., *Los Angeles*Chapline, Frank L., *Los Angeles*Cheney, William S., *Long Beach*Cline, Abe, *Los Angeles*Cook, Eugene Lee, *Torrance*Crump, John Howard, *Long Beach*Cunningham, Terence, Jr., *Huntington Park*Edmeades, Donald Thomas, *Pasadena*Einstein, Robert A. J., *Los Angeles*Feeney, John Robert, *Los Angeles*Finerman, W. B., *Los Angeles*Freedman, Eugene, *Los Angeles*French, Richard Louis, *North Hollywood*Gering, George, *Los Angeles*Goldberg, Benjamin, *Beverly Hills*Gray, Alan Winchester, *Pasadena*Gruenberg, Herbert M., *Los Angeles*Harris, M. Coleman, *Beverly Hills*Herrmann, Victor A., *Los Angeles*Holvey, Ervin H., *Los Angeles*Howard, John Richard, *Downey*Huerta, Salvador J., *Los Angeles*Jacobs, Nathan, *Sierra Madre*Jadg, Wilfred Dayton, *Los Angeles*Johannesen, Robert E., *Pasadena*Johnson, James Robert, *Huntington Park*Kahn, Jack L., *Los Angeles*Kaslow, Arthur L., *Los Angeles*Kassel, Maxwell S., *Burbank*Kuhn, Robert, *Los Angeles*Lewe, Irving A., *Los Angeles*Lovas, Arnt, *Maywood*Ludmerer, Sol, *Long Beach*Martinson, Donald L., *Long Beach*McClellan, Jay Harlee, *West Los Angeles*McDermott, Alza M., *North Hollywood*McGurl, Frank J., *Beverly Hills*Moore, Telford I., *North Hollywood*Morrison, Lester M., *Los Angeles*Mumler, William C., *Los Angeles*Nielsen, A. E., *Los Angeles*Nesson, Willard I., *San Marino*Oakes, Harold Forest, *Beverly Hills*Papkin, George, *Burbank*Payne, DeWalt, *Whittier*Peake, William Marion, *Long Beach*Pelton, Bernard L., *Long Beach*Petrich, John M., *San Pedro*Piser, Alfred L., *Inglewood*Pyle, Wynand, *Los Angeles*Randall, Morton H., *Beverly Hills*Shafer, Norman S., *Los Angeles*Shapiro, Abe O., *Los Angeles*Smith, Earl Harvey, *Tarzana*Smith, Gordon Knight, *Los Angeles*Stoll, John Esher, *Monrovia*Strouse, Carl David, *Los Angeles*Surridge, Robert C., *Los Angeles*Taylor, Harriett S., *Covina*Thale, Harold B., *Los Angeles*Tyler, Edward T., *Los Angeles*Vaughn, Arax J., *Huntington Park*Walker, Homer M., *Los Angeles*Walker, Leon R., *Monterey Park*Wall, John William, *Los Angeles*Weleber, Ferdinand, *Glendale*Wells, James Hadley, *Roscoe*Whitman, Joseph Jay, *Los Angeles*Wigod, David, *Long Beach**Mendocino-Lake County (1)*Barr, Robert M., *Upper Lake**Orange County (1)*Kingman, C. A., *Santa Ana**Riverside County (1)*Godwin, Bernard E., *Riverside**Sacramento County (1)*Roy, Wallace M., *Sacramento**San Bernardino County (5)*Cannon, Espey F., *Redlands*Hoag, Leslie G., *Upland*Hunt, Guy M., Jr., *Loma Linda*Pardoll, Davis H., *San Bernardino*White, T. Robert, *Redlands**San Francisco County (17)*Baron, Shirley Harold, *San Francisco*Boverman, Maxwell, *San Francisco*Chartock, Harry, *San Francisco*Fitzgerald, William J., *San Francisco*Fitzpatrick, Thomas J., *San Francisco*Gasparini, Francis L., *San Francisco*Hack, Rudolf W., *San Francisco*Ingram, Ivan N., *San Francisco*Kornfeld, Hedda, *San Francisco*Kuzell, William C., *San Francisco*Lyons, Harold M., *San Francisco*Nelson, Donald R., *San Francisco*Perlman, Robert Maximilian, *San Francisco*Shapiro, Philip, *San Francisco*Skaff, John E., *San Francisco*Tompkins, Pendleton S., *San Francisco*Uldall, Jorgen J., *San Francisco**San Joaquin County (1)*Allred, Laurence, *Stockton**Santa Clara County (1)*Friedlander, Ernst, *San Jose**Stanislaus County (1)*Denenholz, Edward J., *Modesto**Tulare County (1)*Huish, F. Grenville, *Berkeley**Ventura County (4)*Hanson, M. C., *Ventura*Hunter, J. M., *Ventura*Maguire, J. F., *Ventura*Musgrave, D. P., *Fillmore*

Transfers (21)

- Anderson, Ernest R. V., from *Ventura County* to *Los Angeles County*
 Austin, John H., from *Riverside County* to *Los Angeles County*
 Benson, E. H., from *Alameda County* to *Imperial County*
 Bingham, Elmer, from *San Luis Obispo County* to *San Joaquin County*
 Brandon, Kathryn E. B., from *San Diego County* to *Los Angeles County*
 Cronemiller, Ray Edward, from *Tulare County* to *Los Angeles County*
 Curtis, Gilbert DeWitt, from *San Bernardino County* to *Los Angeles County*
 Gericke, Otto, from *Mendocino-Lake County* to *San Joaquin County*
 Hamilton, Van R., from *Los Angeles County* to *Riverside County*
 Harner, C. E., from *Los Angeles County* to *Riverside County*
 Haskell, Joe S., from *Los Angeles County* to *San Bernardino County*
 Hillstrom, Earl N., from *San Francisco County* to *San Bernardino County*
 Hollingsworth, Parker, from *Alameda County* to *Yolo County*
 Ice, William H., from *San Francisco County* to *Los Angeles County*
 Laird, George J., from *San Diego County* to *Yolo County*
 Malcolm, J. C., from *Tulare County* to *San Joaquin County*
 McBride, June Parrott, from *San Diego County* to *Los Angeles County*
 McCloy, Neil Patrick, from *Los Angeles County* to *San Francisco County*
 McKenney, A. C., from *San Francisco County* to *Los Angeles County*
 Riechel, Leslie, from *San Francisco County* to *Los Angeles County*
 Rouff, Elliot A., from *Santa Clara County* to *Los Angeles County*

Associate Members (3)

- Harvey, Andres M., *Los Angeles County*
 Johnson, I., *Marin County*
 Thomas, Katherine, *Marin County*

Resignations (2)

- Rayner, H. W., *Sacramento County*
 Sloan, J. M., *Alameda County*

In Memoriam

Allen, Charles Lewis. Died at Los Angeles, May 28, 1946, age 85. Graduate of the University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1887. Licensed in California in 1907. Doctor Allen was a Retired Member of the Los Angeles County Medical Association, the California Medical Association, and an Affiliate Fellow of the American Medical Association.



Broderick, Thomas Aloysius. Died at San Francisco, June 8, 1946, age 36. Graduate of Rush Medical College, Illinois, 1938. Licensed in California in 1939. Dr. Broderick was a member of the San Francisco

County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.



Carnazzo, Sebastian Alfred. Died at Monterey, May 10, 1946, age 38. Graduate of Creighton University School of Medicine, Omaha, Nebraska, 1931. Licensed in California in 1940. Doctor Carnazzo was a member of the Monterey County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.



Champion, John Austin. Died at Colton, May 22, 1946, age 83. Graduate of the Medical College of Ohio, Cincinnati, 1888. Licensed in California in 1895. Doctor Champion was a Retired Member of the San Bernardino County Medical Society, the California Medical Association, and an Affiliate Fellow of the American Medical Association.



Charles, Henry Lewis. Died at Alhambra, May 15, 1946, age 65. Graduate of Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1906. Licensed in California in 1921. Doctor Charles was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.



Clarke, Frederick Ernest Keane. (Captain, Army of the United States.) Died at Camp Shelby, Mississippi, May 14, 1946, age 46. Graduate of New York University College of Medicine, New York, 1927. Licensed in California in 1938. Doctor Clarke was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.



Crane, Edward Harrison. Died at Inglewood, May 2, 1946, age 70. Graduate of State University of Iowa College of Medicine, Iowa City, 1904. Licensed in California in 1926. Doctor Crane was a Retired Member of the Los Angeles County Medical Association, the California Medical Association, and an Affiliate Fellow of the American Medical Association.



Ellsworth, Amos Dolbier. Died at Long Beach, May 20, 1946, age 71. Graduate of Hahnemann Medical College and Hospital of Philadelphia, Pennsylvania, 1900. Doctor Ellsworth was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.



Kluss, Edwin Rudolph. Died at Santa Barbara, May 7, 1946, age 43. Graduate of the University of Michigan Medical School, Ann Arbor, 1931. Licensed in California in 1932. Doctor Kluss was a member of the Santa Barbara County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.



Rees, Harry Clayton. Died at Los Angeles, May 26, 1946, age 72. Graduate of the Vanderbilt University School of Medicine, Nashville, Tennessee, 1898. Licensed in California in 1912. Doctor Rees was a Retired Member of the Los Angeles County Medical Association, the California Medical Association, and an Affiliate Fellow of the American Medical Association.

NEWS and NOTES

NATIONAL • STATE • COUNTY

ALAMEDA

Survey of need for a general hospital to serve San Leandro and Hayward is being made by a committee representing the Chambers of Commerce of the two cities. Committee members are questioning physicians in the area to determine whether a hospital is needed and how much support might be expected if one is established.

CONTRA COSTA

First local grange to report to the California State Grange that it had signed a majority of membership for participation in California Physicians' Service was Danville Grange No. 85 in Contra Costa County. Reporting 92 per cent of its membership enrolled on May 22, it was closely followed May 27 by the Oakdale Grange in Stanislaus County with 80 per cent, and soon afterward by Diablo Valley Grange in Contra Costa County with 67 per cent participation. Enrollment in other granges continues, with many reporting indications that majority sign-up will be accomplished.

FRESNO

Search for a medical director and superintendent of the Fresno County General Hospital, to fill the post vacated July 1 by the resignation of Dr. H. M. Ginsburg, is being carried forward by the county board of supervisors. Meanwhile, Dr. Ginsburg has offered assistance although he has turned to private practice. The supervisors recently agreed to increase Dr. Ginsburg's salary from \$9,000 a year to \$14,200, apparently in an attempt to keep him in the post which he had held for 15 years.

Dr. Joseph R. Smith, Fresno, has returned after three years' service in the Army Medical Corps to resume his practice as a specialist in urology. In the Army he was in charge of urology clinics in several hospitals.

Dr. William Everett Furze of Fresno and Dr. Fred E. Cooley, formerly of Dinuba, both recently discharged from the Army Medical Corps, have resumed practice with offices in a new medico-dental building in Fresno. Dr. Furze is a graduate of the University of Pennsylvania School of Medicine. He was medical resident at the Fresno County General Hospital from 1938 to 1940, and Dr. Cooley was surgical resident at the same hospital until he entered private practice in Dinuba before the war.

LOS ANGELES

Dr. H. O. Swartout, to prevent impairment of his health, resigned as Los Angeles County health officer June 30 and at the same time recommended consolidation of the city and county health departments with City Health Officer George M. Uhl as head. Studying the consolidation proposal, the County Board of Supervisors is at the same time considering several possible successors to the county post who were suggested by Dr. Swartout. Those suggested are Dr. Harold Choje, San Joaquin District assistant health officer; Dr. Norman

Nelson of the University of California at Los Angeles; Dr. H. C. Pulley, chief assistant city health officer, and Dr. I. O. Church of Santa Barbara County.

Dr. Colby Hall of Los Angeles recently took office in Chicago as vice president of the American Laryngological, Rhinological and Otological Society.

Dr. John W. Higgins, after two years as a Naval Medical officer, has returned to private practice in his offices on Whittier Boulevard, Los Angeles.

Dr. Willard Nesson has opened offices in San Marino to resume a practice which he relinquished to serve in the United States Coast Guard Medical Corps for more than three years.

Dr. John G. Staub, former Pomona physician and until recently in the Navy Medical Corps, has begun to practice in Claremont where his offices will be in a building which he purchased a short time ago.

Dr. J. Beckham Marr of Pomona has resumed practice there following his discharge from the Army Medical Corps in May.

A trust fund of \$84,500 for use in research by the staff of 500 doctors who donate time to treating patients in the Los Angeles General Hospital is, in effect, being set up by the doctors themselves.

Money for the fund is coming from billings by the hospital to patients in the "able to pay" class who have been treated there because other hospitals in the vicinity were too crowded to accommodate them.

These billings have the approval of the county board of supervisors. More than \$35,000 has been collected already, and additional funds to bring the total to \$84,500 are expected during the next fiscal year.

Proposed research projects to be paid for by the fund will be submitted to the staff medical advisory board. The staff will not be restricted in its choice of fields for research.

ORANGE

Dr. Harry R. Sickafoose, who formerly practiced in Wilmington, California, has moved to San Clemente where he has opened offices in the Bank of America Building.

SAN BERNARDINO

Dr. Merle Cosand, former Navy officer, has been named health officer for San Bernardino County to succeed Dr. W. W. Fenton who retired July 1. He was recommended to the \$500 a month post by the medical advisory board of the county hospital.

Dr. N. Berwyn Lawrence, following completion of a course in obstetrics and gynecology at the University of Pennsylvania, has returned to California where he will continue his studies at White Memorial Hospital, Los Angeles. He plans ultimately to return to practice in Colton, where he was located before entering the Army.

SAN FRANCISCO

Dr. George Pierce of San Francisco was elected president of the American Association of Plastic Surgeons at a conference of that organization in Toronto early in June. He succeeds Dr. John S. Davis of Baltimore.

Sanitary conditions in bars and restaurants was principal topic when San Francisco Grand Jury discussed the city's health problems with Dr. J. C. Geiger, Health Director, in a June meeting. Dr. Geiger told the jury about one-third of these establishments fall below minimum standards and are cited under the health code as fast as violations are discovered. Germ cultures made from swabs taken from dishes, glasses and silverware are the main means of check-up.

Wallet-size cards certifying birth registration, and carrying data useful in identification, proving citizenship and establishing the age of the bearer, have been made available to persons born in San Francisco County.

The cards, issued on application as an alternative to the usual complete copy of the birth certificate, do not include medical details and personal information regarding parents. They are issued by the Department of Public Health on payment of a one-dollar charge, the same fee that is required for issuance of a detailed copy of the birth certificate.

SAN JOAQUIN

Dr. C. V. Thompson, California Medical Association Councillor-at-Large from the Fourth District, has reopened his offices in Lodi. Dr. Thompson had been in the Army from early 1941 until his recent discharge with rank of colonel.

SAN MATEO

Dr. V. H. Heinz is planning to open offices in Burlingame, where he practiced before entering the Navy Medical Corps four and a half years ago.

SANTA CLARA

Dr. E. I. Bartlett has disposed of his share in the South San Francisco General Hospital to Dr. Thomas

McVeagh of Palo Alto, who formerly practiced in Hawaii. Dr. Bartlett will continue to teach in the surgical department of the University of California Medical School and will maintain limited practice in his San Francisco office. Dr. McVeagh will be associated in the hospital with Dr. Wendell H. Musselman and Dr. M. R. Oliva, who also own shares.

Dr. Charles E. Schoff has been named medical house officer at the Palo Alto Hospital, and Dr. William Clinite, a surgeon, also has been added to the resident staff. Plans are to add an obstetrician later. Idea behind the three-man resident staff is to eliminate delay in handling emergency cases and reduce the number of emergency calls the community's physicians in private practice are required to answer.

Recent advances in cell respiration were discussed by Professor John Field of Stanford University's physiology department at a May dinner meeting at Stanford Union, which was attended by 45 physicians interested in anesthesiology as a medical specialty. Dr. Field's paper dealt with advances and anticipated progress in anesthesia, hormone and cancer research. It was discussed by Dr. John Dillon, Army Medical Corps, of Letterman Hospital, and by others at the meeting. The dinner meeting brought together the Northern California branch of the American Society of Anesthesiologists and the Palo Alto anesthesia research group.

SONOMA

Dr. A. Morse Bowles, Santa Rosa, has been elected to the California Academy of Medicine.

TULARE

Post of health officer for Tulare County, recently resigned by Dr. A. E. Raitt, has been offered to Dr. Walter B. Quisenberry of Lincoln, Nebraska, at a salary of \$6,000 a year. Dr. Quisenberry had applied for the position, asking \$6,600. County supervisors say the applicant qualifies for the post. He received his training at the Johns Hopkins Medical School, has served in public health positions in Virginia, Nebraska, the United States Public Health Service and the armed forces.

(Continued on Advertising Page 28)

INFORMATION

Sickness Unemployment Benefits

Under terms of a new California law, practicing physicians are confronted with the task of certifying the physical or mental condition and the probable duration of illness of persons applying for such certification as a prerequisite to collection of unemployment benefits available to them if they are unemployed because of sickness or injury.

The provision for benefit payments in such cases is contained in a recent amendment to the California Unemployment Insurance Act. Because of alternate provisions for financing the payments, the date when payments will begin is not certain. It may be set earlier than May, 1947, but not later.

Although some burden of paper work as well as professional judgment falls upon the physicians in the certification process, James G. Bryant, chairman of the California Employment Stabilization Commission which administers the law, has promised a minimum of red tape in setting up the administrative structure. In a letter to Dr. Philip K. Gilman, then president of the California Medical Association, Mr. Bryant said the commission will strive for "the least possible burden on the physicians" and that there will be "no interference with their relationships with their patients."

DIGEST OF EFFECT ON PHYSICIANS

A digest of provisions of the law affecting physicians follows:

The Legislature at the Special Session held during January and February, 1946, enacted a new law amending the Unemployment Insurance Act to add to the benefits of that act payment of weekly compensation (in amounts varying from \$10 to \$20 per week) to persons unemployed because of sickness or injury. This new law was actively sponsored by Governor Warren, by Senator John F. Shelley, of San Francisco, and the State Federation of Labor. The law adds no new tax; instead it diverts to the Sickness Disability Fund the 1% payroll tax on employees which has heretofore been used along with the employer's tax to finance unemployment compensation.

Under the new law any person who goes off the payroll of his employer due to a "disability" is entitled to receive money payments from the California Employment Stabilization Commission in the same amount and to the same extent that he would have received if unemployed for other causes. Employees who are disabled are to secure their disability compensation checks through public employment offices and in the same manner as unemployment compensation is paid.

EFFECTIVE DATE

The effective date of the new law is not certain. It is provided that disability benefits become payable either one year after the effective date of the new law (which would be in May, 1947) or ninety days after the Social Security Board decides that 1944 and 1945 payroll taxes already collected and in the Federal treasury may be used to finance the new disability benefit law, if the Social Security Board should so decide. It is very questionable that the Social Security Board will permit taxes collected from California employees in 1944 and 1945 and already transmitted to Washington to be returned to Sacramento; but if it does, then the new law would go into effect within ninety days from such time. Hence, the effective date may be at any time before May, 1947, but no later than that.

To become entitled to "disability benefits" an employee must be suffering a *non-industrial* illness or injury, physical or mental, which renders him "unable to perform his regular or customary work." Pregnancy is expressly excluded from the definition of disability. The law provides two major prerequisites which an employee must fulfil in order to collect benefits. First, there is a mandatory waiting period of seven consecutive days for each "period of disability." Second, after the waiting period of seven days the employee must, in addition, furnish the Employment Stabilization Commission with a "certificate" from a "physician" certifying (a) "as to the disability of the claimant," and (b) as to the "estimated duration of such disability." The new law defines a "physician" as a doctor of medicine or an osteopathic physician and surgeon or a chiropractor.

If, after waiting seven days and presenting a "physician's certificate," a claimant is turned down by the

Employment Commission, he may demand a closed hearing before a referee. The law provides that all medical records of the commission are secret and confidential, and may not be opened to public inspection. It is not clear whether the "physician's certificate" is included as a "medical record of the commission."

TEST OF EMPLOYABILITY

The new law also provides for "voluntary plans" of disability benefits, either by employers themselves or through private insurance companies. However, the law does not lay down any medical requirements for payment of disability to be used by voluntary plans; therefore, it may be assumed that if voluntary plans do operate under the law the reports or certificates required by them will be somewhat similar to those now required by health and accident insurance companies.

Each practicing physician should bear in mind that when the new disability benefits law goes into effect, he will be called upon from time to time to fill out and sign "physician's certificates" for use by his patients in attempting to collect disability benefits from the California Employment Stabilization Commission. Under the law, the test for determining whether a person is or is not entitled to disability benefits is as follows: Is the patient "unable to perform his regular or customary work" due to a physical or mental illness or injury (other than an illness arising in connection with pregnancy) that is non-industrial in origin? The certificate of the physician is supposed to include two statements: First, whether the patient is suffering from a disability, as above defined; and, second, the estimated duration of such disability.

The law thus imposes upon physicians (including in that term, for the purposes of this law, both osteopaths and chiropractors) the duty of determining both the physical or mental condition of the patient and whether or not such condition renders the patient "unable to perform his regular or customary work," plus an estimated duration.

Each physician will be thus placed in a position of being a judge as to whether his patient is entitled to any payments under the provisions of the law. If a physician completes and signs certificates in cases where disability is very doubtful, a record will be made against him by a government bureau, and it is not even clear under the law whether such records are secret. If a physician refuses to complete and sign the certificates in all doubtful cases, he will undoubtedly be severely criticized by some of his patients. It will be very important for each doctor of medicine to use his best efforts to be extremely fair in signing or refusing to sign physician's certificates under the disability benefits law.

The exact form of physician's certificate will be determined by the California Employment Stabilization Commission, and every effort will be made by the California Medical Association to cause the commission to adopt as workable a form as may be devised under the severe limitations of the law. When a physician's certificate form is adopted by the commission, all members of the association will be advised.



Letters to the Editor . . .

LIFE-LONG POSTVACCINAL IMMUNITY

Supplementing their earlier work, Freund¹ and his associates of the New York City Department of Health report the production of a life-long specific immunity in laboratory animals following injection of a single or multiple dose of emulsified typhoid vaccine. Control animals given the routine saline vaccine showed only an inadequate transient, specific antibody production.

In 1944 Freund² demonstrated that formalin-killed typhoid bacilli emulsified in a mixture of "aquaphor" (a lanolin-like substance) or "falba" (a lanolin derivative) and mineral oil is a much more efficient specific antigen than the same bacilli suspended in salt solution. Control subcutaneous injections of the routine saline vaccine led to the production of slightly more than 100 units of specific agglutinin per cc. of serum by the end of two weeks in rabbits, falling to less than 10 units per cc. by the end of 8 to 10 months. The titer remained at practically zero till death of the animals. The same vaccine dose injected in the form of a falba-mineral oil emulsion, led by the production of an agglutinin titer in the neighborhood of 3,000 units per cc. by the end of 6 weeks, falling to approximately 1,000 units per cc. by the end of 8 to 10 months. The emulsified vaccine was thus from 30 to 100 times more effective than the saline vaccine, depending on the stage of immunity taken for comparison.

Following completion of these tests the serums of all emulsion vaccinated rabbits were titrated monthly till their death. Eighteen of the animals given the emulsified

vaccine died about 18 to 30 months after the final vaccination dose. Their average serum titer 1 month before death was 260 units per cc. Eight of the animals are now living, over 3 years after the final emulsified vaccine dose. Their average serum titer at the present time is 240 agglutinin units per cc., or about twice the second week maximum titer of control animals given the saline vaccine.

Freund concludes from these tests that in rabbits given the emulsified vaccine antibody formation was proceeded actively during the entire 3 year period of observation. Antibodies introduced passively disappear within a few weeks from the circulation. This long duration of antibody formation is analogous to the life-long antibody formation after infection with certain living viruses. A similar sustained postvaccinal immunity has been demonstrated following injection of laboratory animals with emulsified non-viable influenza virus³, which finding has been confirmed on man⁴. Emulsified allergens have not yet been tested.

P. O. Box 51.

W. H. MANWARING,
Stanford University.

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BOOK REVIEWS

ELECTROCARDIOGRAPH INCLUDING AN ATLAS OF ELECTROCARDIOGRAMS. By Louis N. Katz, A.B., M.A., M.D., F.A.C.P., Director of Cardiovascular Research, Michael Reese Hospital, Chicago, Illinois; Professorial Lecturer in Physiology, University of Chicago, Chicago, Illinois. Cloth. Price, \$12.00. Pp. 883, illustrated with 525 engravings, including over 1,000 electrocardiograms. Second edition, enlarged and thoroughly revised. Philadelphia: Lea & Febiger, 1946.

In this second edition the author has thoroughly revised and expanded his material in the light of recent changes in fundamental concepts and clinical interpretation of the electrocardiogram. The subject is comprehensively surveyed in orderly fashion, and the value of the book as an introduction to the subject and as a source reference is enhanced by its systematic presentation of the material in well defined sections and chapters. Throughout the book illustrative tracings are plentiful, clearly reproduced and well correlated with descriptive material and interpretations. The bibliography is complete but difficult to use, in that it is appended to the three major sections without subdivision by subject or chapter.

Basic electro-physical concepts and appropriate physiologic principles are adequately presented from the author's point of view, as is the controversial subject of the Einthoven hypothesis and vector analysis.

The interpretation of the electrocardiogram and its

correlation with clinical data, and the consideration of the arrhythmias occupy the two major sections of the book. The "patterns" of various electrocardiographic abnormalities are abundantly illustrated and correlated with associated disease processes. In the opinion of the reviewer, the inclusion of the T wave abnormalities seen with acute nephritis, as a specific pattern is not warranted. The author's use of CF₂, CF₄ and CF₅ as routine chest leads solves in part the technical difficulty in obtaining routine multiple chest leads, but at best must be considered a practical compromise in the use of the exploring electrode.

This book should take its place as a valued text book and important reference work on the subject of electrocardiography.

EXERCISES IN ELECTROCARDIOGRAPHIC INTERPRETATION. By Louis N. Katz, A.B., M.A., M.D., F.A.C.P., Director of Cardiovascular Research, Michael Reese Hospital, Chicago, Illinois; Professorial Lecturer in Physiology, University of Chicago, Chicago, Illinois. Cloth. Price, \$6.00. Pp. 288, illustrated with 141 engravings containing 166 electrocardiograms. Second edition, thoroughly revised. Philadelphia: Lea and Febiger, 1946.

This companion atlas of the author's text book of electrocardiography has been thoroughly revised, and additional pertinent illustrative tracings added. As in the previous edition its primary purpose is to initiate

the reader in the approach to the interpretation of the unknown electrocardiogram. This purpose is satisfactorily fulfilled, and an excellent sampling of the varieties of electrocardiograms encountered in clinical practice is presented. Interpretative data and clinical correlations are concisely and conveniently presented. The inclusion of more cases in which necropsy material could be correlated with clinical conclusions, would be desirable.

CORNELL CONFERENCES ON THERAPY. Volume One. Edited by Harry Gold, M.D., managing editor; David P. Barr, M.D.; Eugene F. DuBois, M.D.; McKeen Cattell, M.D., and Charles H. Wheeler, M.D. Cloth. Price, \$3.25. Pp. 322. New York: The MacMillan Company, 1946.

This volume consists of stenographic notes of therapeutic conferences held at Cornell Univ. Medical College. The subjects of the conferences include such titles as "The Doctor's Bag," "Use and Abuse of Bed Rest," "Digitalis vs. Digitoxin," "Management of Abdominal Distension," etc. Fifteen conferences are listed and include subjects of interest to physicians of all specialties as well as to general practitioners. The discussions are in the nature of round-table informal talks with space allotted for questions from the audience. Each conference is summarized at its end by the moderator. The participants are outstanding members of the faculty and include every department of the Medical College and Hospital.

Of unique interest is the fact that the volume represents a joint venture of men representing both the Department of Medicine and the Department of Pharmacology. As such, the therapeutic discussions are given a physiologic-pharmacologic emphasis that is significant. The cooperative relationship permits the pharmacologist and the clinician to present a balanced discussion.

A notable feature of the book is that it is up-to-date, and includes material published between 1942 and 1946. The discussion of subacute bacterial endocarditis is an example. Another feature that will appeal to many is the presentation and defense of varying opinions by men of experience in the particular field. In the chapter "Digitalis and Digitoxin," considerable difference of opinion was expressed and defended by such outstanding men as Gold, Cattell, Eggleston, Pardee, Stewart, Levy, Modell and Wheeler. The reader is thus given a critical discussion of an important recent development in cardiac therapeutics.

As the editors note in the preface, the published conferences are not intended to substitute for the textbook or the formal lecture or scientific article. Only certain phases of each topic are discussed, usually the recent developments and controversial questions. Nevertheless, the authoritative character of the remarks, the emphasis on pharmacologic-physiologic applications, the opportunity for expression of differences of opinion, the up-to-date material, and the informal manner of presentation make this volume stimulating and instructive, and a most useful method of medical education. The yearly publication of similar conferences would be of great value in presenting changing thought and new developments in therapeutics.

AGNOSIA, APRAXIA, APHASIA—THEIR VALUE IN CEREBRAL LOCALIZATION. By J. M. Nielsen, N.S., M.D., F.A.C.P., Associate Clinical Professor of Medicine (Neurology), University of Southern California; Senior Attending Physician in Neurology and Assistant in Neuropathology, Los Angeles County Hospital, Los Angeles, California. Cloth. Second edition completely revised. Price, \$5.00. Pp. 292, with 59 illustrations. New York, London: Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, 1946.

The second edition of this monograph differs from its predecessor but little in matters of concept, but mainly

in presentation of many abstracts of histories upon which the author's concepts are based. In the abstracting of these histories alone, culled from the literature of the world and the author's own extensive experience, a great service to students of this fascinating subject has been performed.

The end of the nineteenth and beginning of the twentieth century saw the heyday of the exponents of precise localization of cerebral function. The carrying over of this extreme localization to the higher cerebral functions resulted in reduction to an absurdity in many instances, with the resultant trend so evident in the present day to consider the brain as functioning as a whole. Healthy as this trend may be, it has to some extent at least resulted in throwing out the goose with the feathers. In helping to reestablish on a firm anatomical and physiological basis the localization of certain components of cerebral function, more complex than the simple performance of motor acts and the crude appreciation of sensation, yet not of the complexity of those attributes which determine the total personality, Dr. Nielsen has made a very real contribution to neurology. The further tentative presentation of a nomenclature on this basis will, it is to be hoped, climinate in the future that part of the complexity of the subject which is incidental to confusion of terms.

Although the book is obviously intended for students of neurology, the clear and simple style should make it intelligible to physicians in general, not necessarily as a reference work, but as a means of acquiring a general concept of cerebral function. Certainly the first eight chapters, comprising but 85 pages, presents this subject in the most palatable form in which it can be found in the literature to date.

MODERN MANAGEMENT IN CLINICAL MEDICINE. By F. Kenneth Albrecht, M.D., S.A. Surgeon, U. S. Public Health Service; Kansas State Tuberculosis Consultant; formerly Clinical Director, U. S. Marine Hospital, Baltimore, Md. Cloth. Price, \$10.00. Pp. 1238, illustrated. Baltimore: The Williams and Wilkins Company, 1946.

This book contains an amazing amount of material, well arranged and easy to find. It embraces the whole field of internal medicine and diagnosis by laboratory procedures. It contains a large number of references to modern literature dealing with all the latest therapeutic and diagnostic procedures. It discusses innumerable subjects from psychotic states to industrial poisons and tropical diseases.

It is, in fact, a vade mecum of internal medicine which has been so expanded that it has become a reference work for the library or office.

Criticisms of this type of book are usually justifiable in that the clinical descriptions of disease are too rigid and oversimplified and the therapeutic procedures, in most part, represent meddlesome medicine. Dr. Albrecht has not fallen into these errors. The busy practitioner who is too "busy" to keep up with modern medical advances will be rewarded by real help when he uses this book as a guide. He will often solve his problems by the use of the references to recent literature which follow the subjects discussed in the book.

This volume is the best of this type which has appeared and should prove valuable to every internist.

THE BIOLOGY OF SCHIZOPHRENIA. By R. G. Hoskins, Ph.D., M.D., Director of Research, Memorial Foundation for Neuro-Endocrine Research, Harvard Medical School and Worcester State Hospital, New York; W. W. Norton & Company, Inc., 1946. Cloth. Price, \$2.75. Pp. 191.

In this brief, well written volume, Dr. Hoskins has brought to bear on the subject of schizophrenia insights

(Continued on Advertising Page 46)



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BOOK REVIEWS

(Continued from Text Section, Page 42)

from biology, physiology, endocrinology, neurology, psychiatry, and sociology. Because schizophrenia is a problem which is so vast in numbers of patients, and so multiple in its implications, the study has great interest for any one concerned with normal humanity, as well as for those concerned with psychosis.

The first section gives a background of human biology. It sketches our whole modern picture of the development of man, from the electron to a social animal living in society. It shows how, at each step of this integrated evolution, unique properties of structure and behavior emerge. It fits such complicated concepts as reproduction, heredity, drives and instincts, consciousness and affect, sexuality and libido, and social behavior into a firm biological framework. A very nice discussion centers around the conflict between ego and superego as symbolizing the conflict between individualism and social orientation. At every level above the molecular, the author points out that a failure of integration could result in some of the phenomena of schizophrenia.

Section two of the book describes the pattern of schizophrenia as it is seen in its incipient, fullblown and terminal stages. These patterns are compared with other known biological patterns such as those of normal childhood, of wolf-children, of behavior following cerebral injury and in other pathological states.

Section three, entitled, "Psychosomatic Aspects of Schizophrenia," is in essence a discussion of controlled endocrine and metabolic observations made in schizophrenics, and a presentation of the effects of treatment.

The final section is in the nature of a summary.

The book can be highly commended for its excellent style and for the objectivity with which Dr. Hoskins evaluates the work of his own research teams. His conclusion, that schizophrenia is primarily a constitutional deficiency of physiological and social maturation, is based both on extensive original studies and on the vast bibliography which he reviews and upon which he draws. The conclusion seems justified by the data which he presents.

Furthermore, the book supplies a good foundation from which future research in schizophrenia and in related problems can go forward. Specific areas for study are indicated, and problems suggested.

In showing how all aspects of human behavior are deeply rooted in biology, the balance is somewhat weighted toward the somatic side. When the question is raised of whether schizophrenia is primarily a problem of nature or nurture, a much more complete picture is drawn of the evidence for constitutional inadequacy than for any evidence which may exist concerning the effects of individual patient experience. We are not told what kinds of childhood these patients endured. It is not explored, whether or no it is the individual with an innately deficient capacity for maturation who succumbs more readily to unfavorable social pressures, although such a possibility is hinted in the discussion of feral human beings.

However, if psychosomatic understanding can be thought of as a resynthesis on the highest personal-social level of all the knowledge which originates from biological analyses, then Dr. Hoskins' book has taken many of the steps toward this goal. Such cooperative studies should lead eventually to the finding of the most meaningful relations between constitution and environment, both as they are highlighted in psychosis, and as they merge into each other in the maturation of everyday people.



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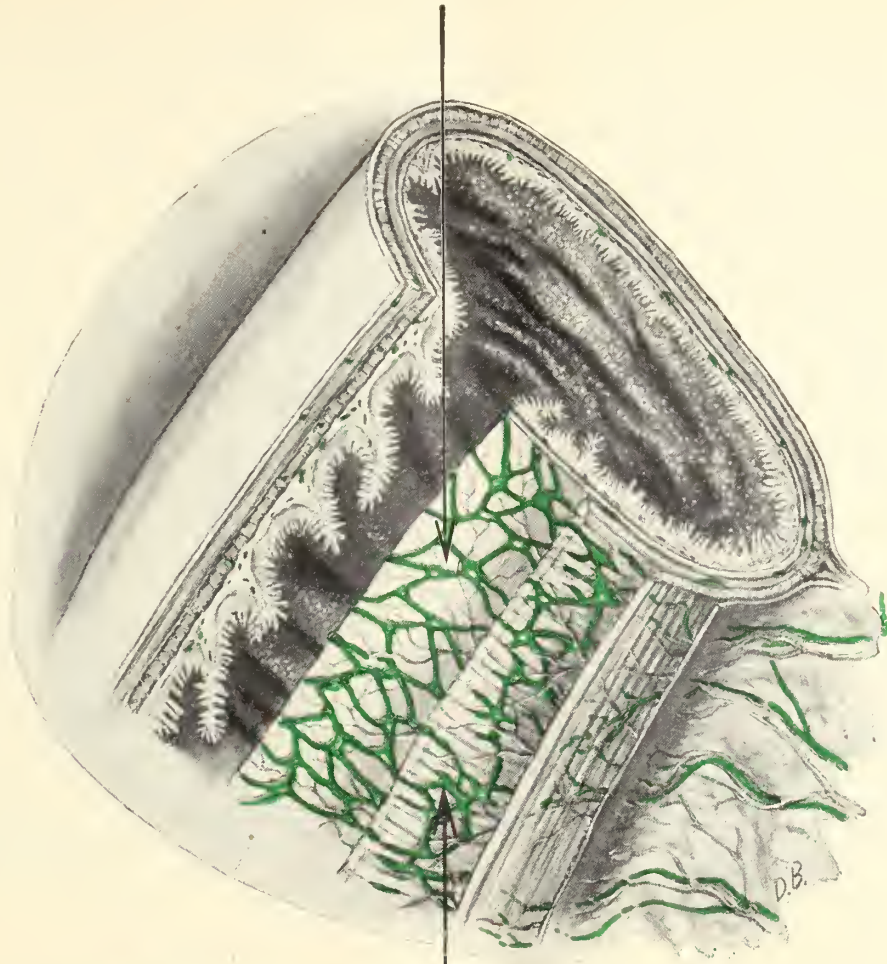
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MEDICAL JURISPRUDENCE

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CONSENT REQUIRED FOR OPERATIONS

It is an established general rule of law that a physician or surgeon cannot operate upon a person without his express or implied consent or, if the patient is legally incapable of consenting, then the consent of someone authorized by law to give consent must be obtained.

The important problem of what constitutes consent to an operation was again presented in the recent case of *Arballo vs. Nielson*, 73 A.C.A. 622, (March, 1946) where California Appellate Court was confronted with the following situation:

On October 13, 1944, the defendant, Dr. X, made an examination of the patient, Mr. I, who was single and forty-six years of age, and found a mass in the lower right abdomen and the patient suffering from nausea. Dr. X thereupon sent the patient to a sanitarium for further treatment, where a cystoscopic examination revealed that the patient's bladder was occupied by a stone approximately the size of a baseball. Throughout this examination, the patient was conscious and in full possession of his mental faculties although there was evidence that the patient appeared to be in a "dazed and semi-conscious condition."

The defendant physician informed the patient of his condition and told him that he could not survive if the stone was not immediately removed. Thereupon, it was contended by the defendant physician, the patient orally consented to an operation. An operation was performed and an aggravated vesical abscess was found. The patient died on October 22, 1944, and it was alleged by the patient's mother, who was the plaintiff in the case, that the operation was performed upon her son without her consent; that she was the proper person to give such consent and, therefore, a technical assault was committed upon her son for which she was entitled to compensation.

During trial of the case, the plaintiff (mother) testified that she had informed the defendant doctor that her son had told her that he did not want to be operated upon and that she told the doctor the same thing. It appeared from the evidence that the plaintiff spoke imperfect English and that the defendant doctor had difficulty in understanding her. The facts presented at the trial revealed that during the cystoscopic examination a nurse employed by the sanitarium and in charge of the case advised the patient's sister, who was present, that her brother was seriously ill and that the doctors believed the only possibility of saving his life was by an immediate operation. The sister thereupon signed a written consent to the operation and testified that she told the nurse that the signed consent should be executed by the plaintiff (mother) but that the nurse asked that she sign it.

From this evidence, the trial court found that the patient was conscious and in full possession of his mental faculties throughout the examination and at the time he gave his consent to the operation, even though the plaintiff produced evidence that prior thereto the patient appeared to be in a dazed and semi-conscious condition. It was argued by the plaintiff that the patient, because of his dazed condition, was incapable of acting for himself in giving consent to the operation and that since no consent was obtained from the mother but

(Continued on Page 50)



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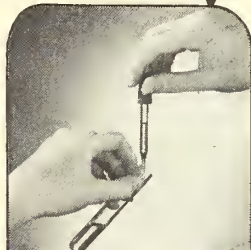
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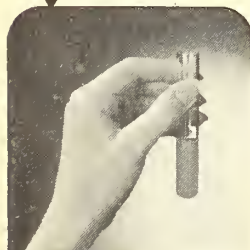
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MEDICAL JURISPRUDENCE

(Continued from Page 38)

only from the sister, the defendant was liable for a technical assault.

The court held for the defendant physician, stating that "at most, such evidence concerning the patient's dazed and semi-conscious condition only created a conflict to be determined by the trial judge." The finding that he did give his consent and was conscious and in full possession of his mental faculties at that time has substantial evidentiary support and cannot be disturbed on appeal.

It should be noted that because the court held that the patient was conscious and in full possession of his mental faculties and therefore capable of giving his consent, it did not have to discuss the problem of

whether the consent by the sister would have been sufficient to protect the operating physician.

This case again illustrates the importance of obtaining the written consent of a patient or, in the case of a legally incompetent person, the written consent of his parents or other legal guardian before performing an operation.

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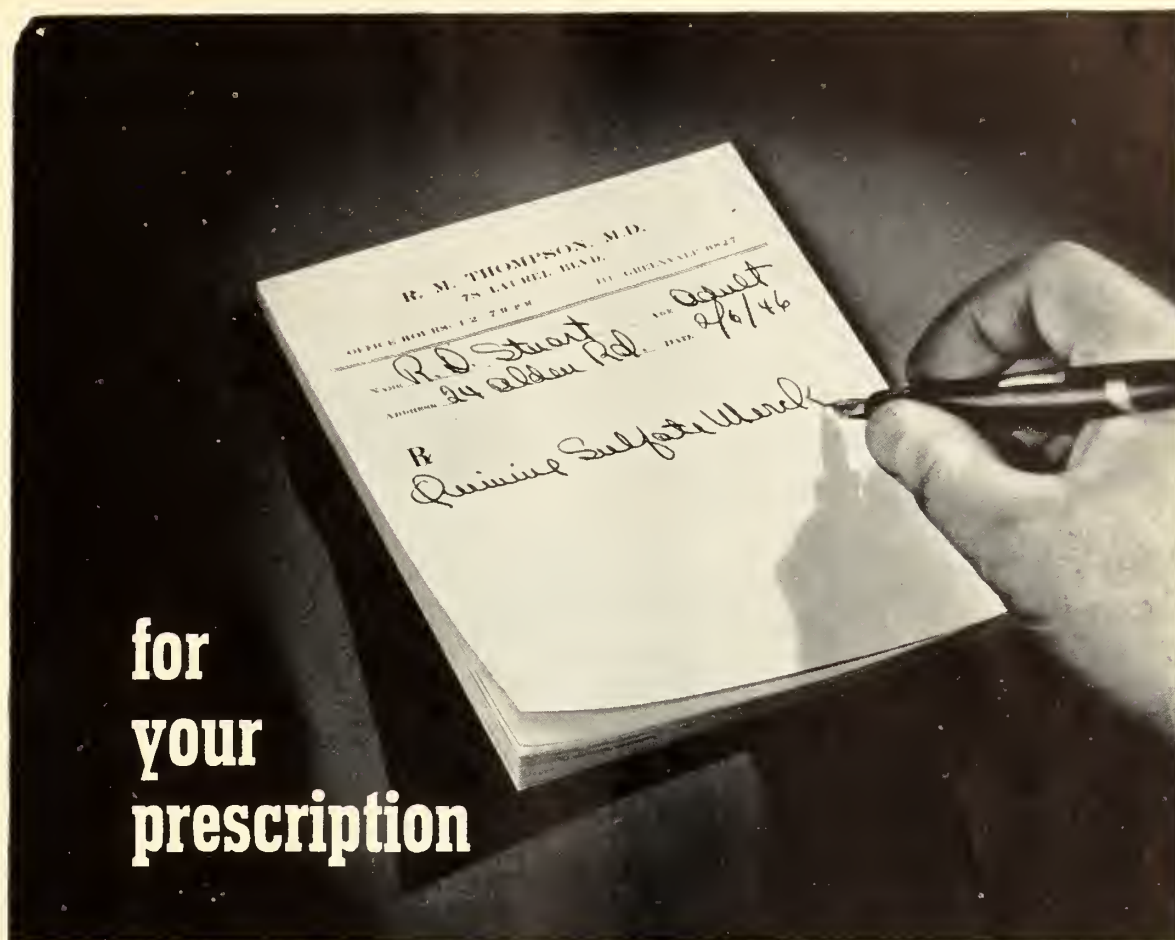
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BOARD of MEDICAL EXAMINERS

A PROGRESS REPORT OF THE CALIFORNIA
STATE BOARD OF MEDICAL EXAMINERS*

FRANK W. ORTO, M.D.

Los Angeles

RECENTLY the Board of Medical Examiners received a request from Dr. Kress to present to the California Medical Association a brief statement regarding the activities and problems which have become so complex with the war years. Therefore, I, as president of the Board, will attempt to give you some of these facts, and as a matter of record and accuracy, will read this report to you.

First let me state that there are ten members of the Board, including the secretary, who are appointed by the Governor, for a period of four years each, the terms being staggered.

The Board has as its function the examination of chiropodists, drugless practitioners and midwives, as well as Doctors of Medicine. Physicians and surgeons may be licensed by written examination, which licenses are designated "Class A"; or they may be licensed by reciprocity based on a license issued by another state, which licenses are designated "Class C"; or they may be licensed by reciprocity based on government credentials, which licenses are designated "Class D"; or they may be licensed by reciprocity based on a National Board certificate, which licenses are designated "Class G." Licenses for drugless practitioners are designated "Class BB"; licenses for chiropodists are designated "Class E" and licenses for midwives are designated "Class F."

As prescribed by law, the secretary does not take part in the examinations. However, primarily, all applicants for licensure are passed on by the credentials committee, of which the secretary is a member. Then recommendations are made according to applicant's qualifications. He must be a graduate of a school recognized by the American Medical Association at the date of his graduation.

The written examinations for physicians and surgeons, as prescribed by section 2288, Business and Professions Code, are the following subjects:

- Anatomy, including histology
- Physiology
- Bacteriology and pathology
- Biochemistry
- Obstetrics and gynecology
- Materia medica, pharmacology and therapeutics
- General medicine, including clinical microscopy
- Surgery
- Public health and preventive medicine.

Questions for these examinations are written by the individual Board member giving that particular subject, and the papers are graded by him. An allowance of \$10 is made to the examiner for every thirty papers graded, and it is possible to grade about six papers an hour. There are sometimes over 200 applicants taking the written examinations.

The written examination is primarily for doctors just out of school, but may be taken by others, if desired by

(Continued on Page 62)


* Read before the First General Meeting of the Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.



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BOARD OF MEDICAL EXAMINERS

(Continued from Page 52)

the applicant, providing he qualifies.

Now, for a Class C certificate (section 2310 of the Business and Professions Code): The Board is required to issue a reciprocity certificate to an applicant to practice a system or mode of treating the sick or afflicted in this State, providing that he is licensed to practice the same system in another state, if that system or mode is recognized by the medical laws of the State of California. An applicant for a reciprocity certificate, whose application is based on a certificate issued by a medical licensing authority of another state, ten or more years prior to the date of the filing of his application with the Board is required to take an oral examination.

If the certificate on which an applicant bases his application for reciprocity is less than ten years old, and all

qualifications are equivalent to what were required by California at the time he was licensed, he is given direct reciprocity, which means reciprocity without examination.

According to section 2210 of the Business and Professions Code, an applicant may base an application for reciprocity on a commission as a medical officer in the United States Army, Navy, or Public Health Service. This is the Class D Certificate. This does not apply to any contract surgeon in the United States Army, Navy or Public Health Service, nor to any officer of the medical reserve corps of the Army, Navy or Public Health Service. "If it appears to the satisfaction of the Board that the applicant was commissioned in the United States Army, Navy or Public Health Service at a time when the requirements of the service for his commission were in any degree or particular less than those which were required for the issuance of a similar certificate to prac-

(Continued on Page 66)

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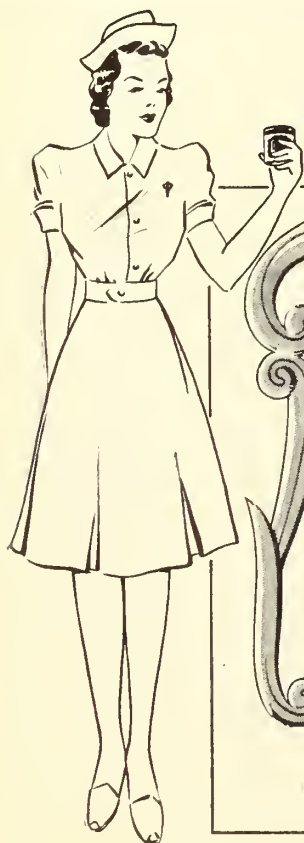
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A	Wheat meal, oatmeal, wheat germ, corn meal, powdered beef bone, alfalfa leaf, brewers' yeast.	15.0	69.9	106	1.20	0.35	2.6
B	Oatmeal, malt syrup, powdered beef bone, powdered yeast.	14.0	69.8	100	*	*	*
C	Semolina, whole wheat flour, corn meal, wheat germ, malt syrup, brewers' yeast.	15.5	71.1	107	1.50	0.37	5.0
D	Whole wheat meal, corn meal, wheat germ, malt, non-fat milk solids, brewers' yeast.	15.0	73.1	102	1.03	0.36	5.4
E	Oat flakes, yellow corn meal, wheat, durum middlings, non-fat milk solids, brown sugar, defatted wheat germ, brewers' yeast, defatted corn germ.	14.74	68.81	104	*	*	*
F	Whole wheat meal, corn meal, wheat germ, malt syrup, dried papaya fruit, non-fat milk solids, brewers' yeast.	15.5	71.35	102	*	*	*

(1) FROM LABEL STATEMENTS OF COMPOSITION ON REGULAR PACKAGES PURCHASED TO MAY 9, 1946.
 (2) REPORT OF THE COUNCIL ON FOODS AND NUTRITION, J. A. M. A., 126:109, 1944, J. A. M. A. 123:902, 1943.
 * NOT REPORTED IN REFERENCE (2).

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BACTERIA—BUGGS, ET AL.—Page heading in J.A.M.A.

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News Behind the News; or Beauty Is More Than Skin-Deep

After poring over X-ray pictures, Dr. J. Howard Crum, Manhattan plastic surgeon, announced that Movie Actress Jane Russell has the handsomest "chest and rib cage" in the world.—*From an Associated Press report.*

Capsule with Meal

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BOARD OF MEDICAL EXAMINERS

(Continued from Page 62)

tice in California at the date of his commission, the Board, in its discretion, may require the applicant to pass a practical, clinical, oral examination before a certificate may be issued; or the Board may, in its discretion, refuse to issue a certificate."

The point of this section (section 2216 of the Business and Professions Code) seems to be misunderstood by most applicants. It is required that the applicant be commissioned in the United States Army, Navy or Public Health Service and that the examination that he took to acquire his commission be equivalent to the examinations required by the State of California at the date of his

commission. The applicant must furnish written proof or a copy of the questions in order to comply with the law.

An applicant may apply for reciprocity basing his application on a license issued by the National Board of Medical Examiners, as provided in section 2194 of the Business and Professions Code, which reads: "An applicant, whose application is based on a diplomate certificate issued by the National Board of Medical Examiners of the United States, shall pay the fee provided by this chapter and, in addition to all other requirements provided for a physician's and surgeon's certificate, he shall file testimonials of good moral character satisfactory to the Board and shall satisfy the Board that the standard of the National Board of Medical Examiners on the date that the diplomate certificate was issued was

(Continued on Page 68)



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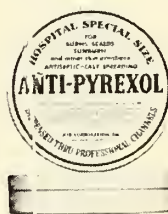
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BOARD OF MEDICAL EXAMINERS

(Continued from Page 66)

in no degree or particular less than that which was required for a physician's and surgeon's certificate under this chapter on the same date. He shall also satisfy the Board that the diplomatic certificate was procured without fraud or misrepresentation and that at no time has any certificate or license issued by any State or the United States or issued by a foreign country been revoked or annulled for unprofessional conduct. The Board may, in its discretion, with or without oral examination, issue a certificate to an applicant who has complied with the requirements provided for a diplomate certificate."

Now, let me state that the Board is composed largely of veterans of World War I, and all these members feel very kindly toward the returning veterans. At no time has there been any discrimination as to race, creed, or politics, or specialty. The applicant is required only to qualify. There has been no endeavor to fail or "flunk" any percentage of applicants. As a matter of fact, I am informed by Dr. William R. Molony, who was president of the State Board of Medical Examiners for many years, that the percentage of failures on the oral examinations now is about the same as in prewar years—approximately 40 per cent.

Also, by special action of the Board, in order to accommodate all applicants, the Board has initiated two-day oral examinations in place of one-day examinations. This will afford examinations for approximately 120 applicants which is more than the number of applicants for the entire year of 1939, when the total was only 95.

I have tried to analyze why returning veterans have failed the oral examinations, and, in questioning them at the examinations, they have given me the answer. Many of them have been in executive positions and have not had opportunity to practice medicine during their active duty while in the service. Others have not seen a medical journal or new medical book, nor attended a medical meeting, and most of them have come before the Board totally unprepared, and without study or review.

Another reason is that the type of medicine practiced in the service, as stated by one doctor himself, was largely high grade industrial work with compound fractures, or hands blown off, or extreme conditions which are seldom seen in private practice. Therefore, they have not had the practical opportunity to keep abreast of new medical procedures in civilian practice.

It has been a pleasure to see many of the applicants who have failed the oral examinations go away saying that they have had a fair examination, realizing their own shortcomings, study extensively in review and clinical work for months, and pass the Board without difficulty. These men realize that they have been most fortunate and that the Board has served its purpose, namely, protecting the people as well as the doctor himself.

Now, as to the civilian doctor who wishes to come to California. Most of them are older men who have had a busy practice during the war years and have not had the opportunity to read journals, attend meetings, or take refresher courses. They feel they have done a good job—which undoubtedly, they have—and they wish to come to California, away from the sleet and snow, in recognition of their work. All this without any preparation, review, or refresher courses. Therefore, the result is inevitable, and the mortality is high in failures.

The State law requires that the examination for these applicants "shall be oral, practical, and clinical in nature," which does not necessarily mean that the applicant is examined only in his particular specialty or field, or the one in which he is certified.

In my own personal experience, I know of a case of a Fellow of the American College of Surgeons who assured me, at the time of his oral examination, that he did nothing but surgery and that was all he intended to do, if he should be successful in the oral examination for licensure in the State of California. He was successful in passing his examination, and later, I was amused to find that he was doing Pediatrics, Geriatrics, Internal Medicine and emergency calls, in order to establish himself in a California practice. Therefore, in my opinion, the California law is justified to require the examiner to ask questions concerning general practice in medicine.

If these men are safe to practice good medicine they deserve every consideration, and will receive it.

It is unfortunate that these physicians who desire to practice in California, whether they are returning veterans or civilian doctors, have not given consideration to the fact that they are leaving communities which they have served, either previously to the war, or during the war, without consideration. Some are selfishly leaving the communities where they have previously practiced, uncovered and unprotected medically and surgically. These men, having practiced in these districts, are aware of the needs of the people and understand their personal problems. Therefore, it seems unfair, and even a bit selfish, to crowd California with doctors when other parts of the country are in dire need of medical service.

The Board is not influenced by the personal opinions of its members, but is guided entirely by the laws of the State of California.

It is amusing to find that some of those physicians who have passed the oral examination come to the Board members and suggest that the Board not permit any more applicants to come into California. This has happened on many occasions, the new licensee not realizing that the Board must and will comply with the law and pass any safe, competent physician.

Members of the Board receive many letters of recom-

(Continued on Page 70)

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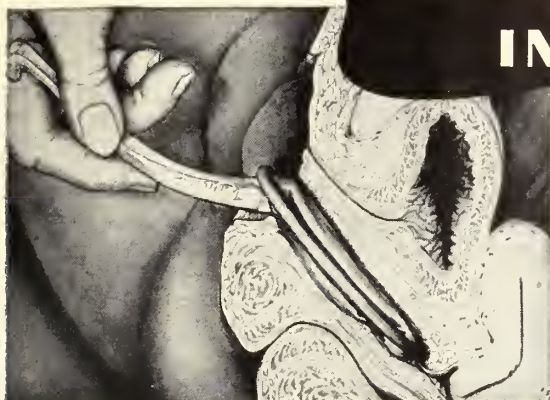
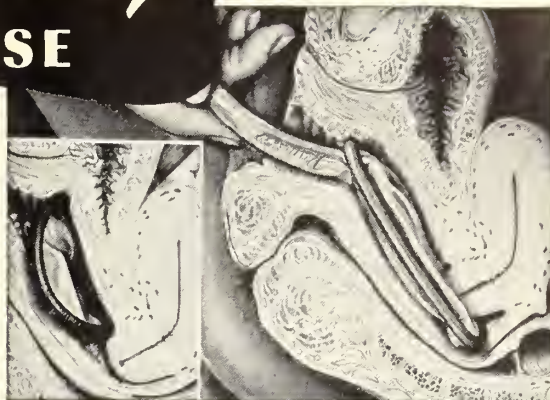
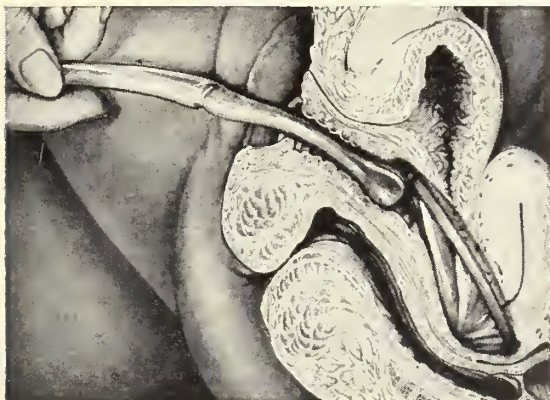
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BOARD OF MEDICAL EXAMINERS

(Continued from Page 68)

mentation from many applicants and their friends. This is all very well, but this Board does not allow itself to be influenced by personal appeals, even from its own good friends. One object of this Board is to comply with and carry out the laws and the spirit of the law as set forth in Chapter 5, Division II, of the Business and Professions Code (the laws regulating the practice of medicine and surgery) and thereby indirectly protect the people, as well as the doctors themselves, from unqualified practitioners.

The Secretary of the Board has prepared certain statistics which might be of interest to you, particularly in the matter of increased work for the Board during the war years, and which is continuing during the post-war period.

The total number of physicians and surgeons registered to the date of April 1, 1946, is 15,866. This number includes members of the armed forces. The registration as of March 2, 1940, was 12,534, which shows there was an increase, during that period, of more than 3,000. The number of physicians' and surgeons' certificates issued in all classes, as of 1940, was 622. The total number of certificates issued for the year 1945, was 1,208, and from January 1, 1946, to March 31, 1946, a three-month period, 455 have been issued. Thus, in the first three months of 1946, ten times the number of certificates have been issued, as of the same period of 1940, and already 73 per cent of the total certificates issued in the entire year of 1940.

There has been some criticism made against the Board regarding the slowness in acting on applications. As of

December 31, 1945, there were 628 applications pending, and from January 1, 1946, to March 31, 1946, there were 819 applications filed, making a total of 1,447 applications to be acted upon, and I am informed that only 160 applications out of a total of 1,447 have not received some action or consideration by the Board as of March 31, 1946.

Another reason that there has been an apparent delay in the issuance of certificates is that when the war was terminated and men returned to this country, the highly trained employees in the office of the Board of Medical Examiners, who were wives of service men, immediately terminated their jobs to go to the husbands who had just returned to this country. This naturally resulted in unavoidable delay because of the lack of skilled help which is hard to replace because of the competition in industries where salaries are so much higher than those paid by the State of California.

In addition to the work of giving examinations, the Board has the responsibility of legal hearings on cases of the violations of the Medical Practice Act for unprofessional conduct as defined by law, at a per diem of \$10.

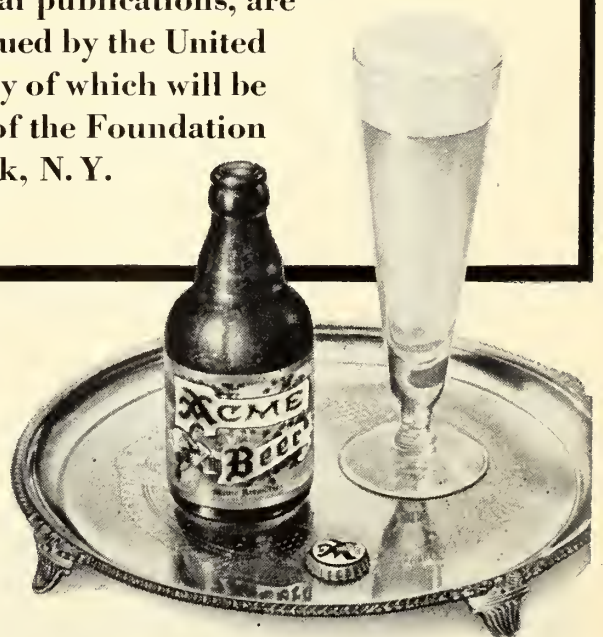
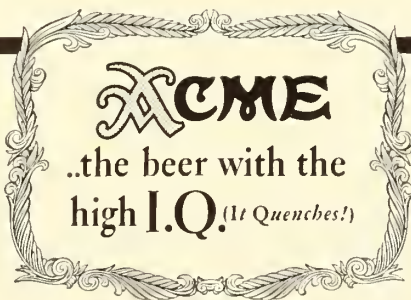
The above facts will give you some conception of the methods of procedure of the Board of Medical Examiners as prescribed by the laws of the State of California.

Therefore, my advice is, if you have any questions, write directly to Dr. Frederick N. Scatena, Secretary of the Board of Medical Examiners, 1020 N Street, Sacramento, for information. This will be authentic, and in writing.

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Board Proceedings

By FREDERICK N. SCATENA, M.D.

Secretary-Treasurer

The Board of Medical Examiners conducted oral examinations at the Board office in San Francisco, June 8 and 9, at which time all applicants who were certified for said examination and appeared, were examined.

Following the oral examinations, the Board met at the Native Sons Hall in San Francisco for a regular scheduled meeting. Written examinations were conducted, and matters of interest to the Board were discussed and hearings held on petitions for termination of probation, revoked certificates and disciplinary matters.

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News

"V.A. in Urgent Need of More Rating Experts—

An urgent appeal for additional physicians to help in rating a backlog of compensation and pension claims was made today by L. C. Chapman, Los Angeles regional manager of the Veterans Administration. Qualified physicians up to 68 years of age will be accepted. As Rating Specialists they will have no medical or hospital responsibilities. Duties are to serve as member of Rating Board to examine medical records, clinical and laboratory reports and service records to determine service connected disabilities, and the extent of such disabilities. . . . Medical rating specialists will have no hospital duties, Chapman said. These permanently established positions offer a yearly salary of \$5,542 for 44-hour week, with 26 days annual vacation with full pay, 15 days sick leave, and other Civil Service benefits. . . . In addition to medical rating specialists, the Veterans' Administration has hundreds of openings for psychiatrists, physiotherapists, training officers, social workers, stenographers, typists, hospital and mess attendants, Chapman said. . . . Applicants may apply to Veterans' Administration Regional Offices at 1380 Sepulveda Blvd., West Los Angeles Veterans Hospital, Wilshire at Sawtelle Blvds., the downtown V.A. office, 1041 S. Broadway, or to the nearest United States Employment Service office." (Hollywood California Valley Advertiser, May 16, 1946.)

"Judge Asks End to 'Gross Injustice'—San Francisco County Superior Judge Sylvain J. Lazarus today urged attorneys to give earliest possible effect to his decision correcting what he called a 'gross injustice done by the State Medical Board,' but the Attorney General's office said the ruling on the status of three California doctors would be carried to the highest courts. . . . The judge ruled Wednesday the State Medical Board must grant licenses to two former Army doctors and allow a third to take an examination even though they were graduated by a Chicago medical school which is not recognized in California. . . . However, to give effect to the decision the attorney for the doctors must prepare findings of fact for the judge's signature, the state has five days thereafter to amend the findings and then five more are allowed by law for hearings on the motions. The judgment then could be suspended by an appeal. . . . Dr. Zelwyn Alexander Aarons, 30, who has been resident physician at San Mateo Community Hospital, told the court he hoped the decision would become final in time to allow him to take the June 10th examination and avoid many months' delay.

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California M E D I C I N E

OFFICIAL JOURNAL OF THE CALIFORNIA MEDICAL ASSOCIATION

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VOL. 65

AUGUST, 1946

NO. 2

Demerol Analgesia In Obstetrics*

ALEXIS MAXIMOV, M.D., *Santa Rosa*

IT may sound strange to say that the medical profession is still in quest of a satisfactory and constantly applicable method of analgesia for the pain of childbirth in view of the dramatic relief offered by continuous caudal analgesia. After reading some of the enthusiastic reports on continuous caudal analgesia, one is likely to conclude that the suffering of parturition has been finally abolished. But it must be pointed out that this procedure is not universally applicable because of certain limitations. It is a highly technical procedure requiring special training and a great deal of practice, and adaptable to patients only in well staffed obstetrical institutions. It demands constant attendance and supervision by the obstetrician during the entire course of its administration.

Despite perfect technique and proper selection of patients, caudal analgesia fails to produce relief of pain in a certain percentage of cases and many patients refuse the procedure because of fear or prejudice. Most important, caudal analgesia carries a definite risk to the patient's life, even in the best of hands, as shown by occasional maternal complications and deaths due directly to the procedure. For these reasons other forms of obstetrical analgesia are still being sought, especially by physicians who do not find optimal conditions in their communities for routine use of caudal analgesia. The shortage of doctors and nurses during the present crisis, and the consequentially greater demand on their time by patients, has certainly curtailed their ability to remain with parturients during the entire course of caudal analgesia.

Doctors and nurses were in short supply in the Sonoma County Hospital, as elsewhere, during the past two years. Hence, a method of analgesia was sought that would produce the desired relief

from pain during labor and at the same time be safe for mother and child and be relatively easy to administer and supervise. After several agents had been tried, Demerol was chosen as the drug meeting such specifications.

From the number of reports in three years on the use of Demerol, alone or in combination with some other agent, it is evident that the drug has already assumed an important place in obstetrics. After a preliminary report by Roby and Schumann² of the Boston Lying-in Hospital, the latter¹ presented a thorough study of 1,000 labors conducted under Demerol-scopolamine analgesia, with an inhalant for actual delivery. In view of the satisfactory amnesia, absence of pulmonary complications, and freedom from depressant effects on the fetus, Schumann concluded that Demerol in conjunction with scopolamine is superior as an obstetrical analgesic to other analgesics in common use. In December, 1945, Carter⁵ reported a series of approximately 2,700 cases from three hospitals in Madison, Wisconsin, in which, after a small preliminary dose of a barbiturate, analgesia was obtained by Demerol-scopolamine, with delivery under nitrous oxide and oxygen. Carter considers that Demerol combined with scopolamine or some other agent is not surpassed by any drug or method now in use.

DEMEROL

Demerol, or ethyl 1-methyl-4-phenylpiperidine-4-carboxylate, is a synthetic agent exhibiting properties comparable to those of both morphine and atropine; the analgesic power is close to that of morphine and the spasmolytic action weaker than that of atropine. It differs from morphine in that it relaxes smooth muscle. The appealing property from an obstetric standpoint is the apparent absence of any significant depressant action on the patient. Uterine contractions are not slowed and the spasmolytic action on the

* Read before the Section on Obstetrics and Gynecology, at the Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

cervix is evident by the rapid dilatation of that organ during labor. Demerol was reported to procure a slight elevation of the blood pressure, especially in toxemic patients, but Carter found little noticeable effect on pulse or blood pressure. The risk of addiction is negligible in the amounts employed obstetrically.

Adequate amnesia is not always produced by Demerol alone, as several investigators⁴ have found, but the addition of scopolamine or a barbiturate generally results in a high percentage of amnesia. Scopolamine is preferred, since there is practically complete freedom from the crises of pulmonary edema seen occasionally with barbiturates. Moreover, Schumann states that the psychic sedation obtained by Demerol through its analgesic effect provides a favorable background for the action of scopolamine, reducing excitement and enhancing amnesia. In most reports, the usual dosage of Demerol was 100 mg. administered intramuscularly when the patient became uncomfortable. Additional doses were injected at intervals thereafter. Less relief was provided by oral administration. Mild side-effects rather frequently follow intravenous administration of Demerol, but the rapid control of pain and increased amnesic effects procured through very slow intravenous administration offer definite advantages, particularly in multiparas. In the present study the intramuscular route was used exclusively.

MATERIAL

Demerol was administered to 300 women in labor at the Sonoma County Hospital between February 1, 1945, and April 1, 1946. These patients were unselected, except that the drug was not given to any patient with toxemia. So far as it is known, toxemia is the only contra-indication to the use of Demerol in obstetrics. A total of 307 infants was born to the 300 mothers, as follows:

Type of Delivery	Number	Percentage
Spontaneous	233	77.6
Low forceps	40	13.3
Breech Extraction.....	10	3.3
Mid-forceps	7	2.3
Twins	5	1.6
Version and extraction....	4	1.3
Triplets	1	0.6

A control group of 300 similar patients was given nembutal, seconal, paraldehyde, dial and scopolamine in varying combinations and doses.

In addition to these 300 vaginal deliveries, there were 14 Caesarean Sections premedicated with Demerol. Because the problem of labor was not present in the majority of this group, it will be discussed in a separate section.

METHOD OF ADMINISTRATION

The following routine of administration was adopted: Demerol 100 mg. and scopolamine 0.48 mg. (1/150 grain) were given intramuscularly as soon as the patient in active labor began to complain, regardless of the degree of cervical dilatation. This combination was repeated in three hours, and Demerol alone given in 100 mg. doses

at three-hour intervals thereafter until the patient was ready for delivery. An attempt was made not to give Demerol or scopolamine within an hour of expected delivery as an additional precaution against possible fetal anoxia. As the study progressed, it was found that Demerol given within an hour of delivery produced no demonstrable depressant effect on the child, whereas the combination of Demerol and scopolamine given similarly resulted in several "slow" babies, that is, babies which required more than the routine measures of resuscitation. The more apprehensive patients were given 0.1 gm. of nembutal or seconal (1½ grains) by mouth at the same time the original dose of Demerol and scopolamine was administered. The barbiturate was not repeated thereafter during labor. This group of patients appeared better sedated than those receiving Demerol and scopolamine alone, and the infants showed no unusual depression. However, the number was too small to permit any valid conclusion.

Of the 300 patients, 250 required but *one dose* of Demerol for their entire labor; 40 patients were given *two doses*, 7 received *three doses*, and 3 had *four doses* or a total of 400 mg. In nearly all cases nitrous oxide and oxygen were used during the second stage of labor. Certain difficult deliveries necessitated continuous nitrous oxide and ether anesthesia. Most of the episiotomies and repairs were performed under pudendal block and local infiltration with 1 per cent Novocain solution.

EVALUATION OF ANALGESIA AND AMNESIA

In the great majority of patients, Demerol and scopolamine produced relief of pain and evidence of sedation within from 15 to 20 minutes after intramuscular administration. The patient usually relaxed, stopped crying and complaining, and fell into a light sleep, rousing somewhat during the pains. The analgesic effect lasted from two to six hours, averaging about three hours.

The patients were interviewed a day or two after delivery for their memory of labor. On the basis of the interview, they were divided arbitrarily into those having (1) complete analgesia and amnesia, (2) satisfactory analgesia, and (3) unsatisfactory analgesia. In the first group fell those having completely painless childbirth without the impingement on the patient's memory of pain or suffering following the administration of Demerol. In the satisfactory group were placed those who remembered isolated incidents during labor but whose suffering was markedly or completely relieved. This group also included patients who volunteered satisfaction with the method and those who referred other patients asking specifically for Demerol in their forthcoming deliveries. Patients with borderline analgesia were not placed in this group. The unsatisfactory group included those claiming no relief with Demerol, the ones who received medication too late in labor for effective action, and those who did not receive the drug according to plan.

Complete analgesia and amnesia was obtained in 126, or 42 per cent, of patients and satisfactory analgesia in an additional 182, or 44 per cent. This gave a combined total of 86 per cent with satisfactory analgesia. In the third group there were 42 patients, 14 per cent, who failed to obtain adequate relief or who did not receive the drugs soon enough or according to plan.

In contrast, only 48 per cent of the control patients obtained satisfactory sedation with the barbiturates, paraldehyde and scopolamine and 52 per cent had unsatisfactory analgesia. The uncorrected 86 per cent incidence of satisfactory sedation in the Demerol-scopolamine treated patients would undoubtedly have been higher had medication been administered earlier or according to plan in the remaining 14 per cent.

LENGTH OF LABOR

The most interesting observation in the majority of the Demerol patients was the rapid cervical dilation that occurred after medication. It was not at all unusual for a primiparous cervix to progress from a dilation of about 2 cm. to complete dilation in the space of from two and one-half to three hours after injection of Demerol.

In the group of 165 primiparas, the length of labor averaged 11.2 hours, as compared with 15.4 hours' labor in the control primiparas. In 135 multiparas, the duration of labor was, on the average, 7.0 hours. The duration of labor in the control multiparas was 9.2 hours. Hence, labor lasted 4.2 hours less in the primiparas and 2.2 hours less in the multiparas treated with Demerol, as contrasted with the control series, reductions of 27 and 24 per cent, respectively, in the duration of labor. Stated differently, about 85 per cent of Demerol-treated patients were in labor for less than four hours after administration of the drug. While it is obvious that a few relatively long or short labors might alter considerably the average figures in a comparatively small series of patients, the same conditions also held in the control series of 300 patients.

UNTOWARD EFFECTS

No untoward effects of any importance were observed. It is possible that these were avoided by not giving the drug intravenously. The following transitory side reactions were noted: Dryness of the mouth and throat in 82 per cent, nausea in 28 per cent, dizziness in 14 per cent, diaphoresis in 12 per cent, vomiting in 6 per cent, and excitement in 4 per cent of the subjects. By way of contrast, the manic state was observed in over 20 per cent of the control subjects given barbiturates and paraldehyde analgesia. There were no instances of edema of the uvula or glottis, as recently reported by Steinberg³ after Demerol-scopolamine analgesia and attributed in all probability to scopolamine. The absence of edema of the uvula in the present series may be due to the fact that minimal amounts of scopolamine were used. There was

no significant evidence of narcotic depressant action and most patients were completely oriented within three hours after delivery. Usually they were able to converse and answer questions during the period of sedation, but little memory of this was retained afterward.

RESULTS IN INFANTS

Schumann's method of classifying the infants according to their condition upon delivery was followed. *Group A* includes those who breathed spontaneously and required no treatment other than the usual inversion and aspiration of the upper airway with a rubber ear syringe. *Group B* includes slightly slow babies who required oxygen and a warm tub in some instances but who respired spontaneously within two minutes. *Group C* babies required more than two minutes of resuscitation before breathing spontaneously. Persistent damage was evaluated in these before discharge. *Group D* included all neonatal deaths, and *Group E* the stillborn infants. Of 307 infants, 293 or 95.4 per cent, belonged in Groups A and B. Of the eight *Group C* infants, six had definite obstetrical causes other than analgesia in the mother to explain their slow response. Since no obstetrical factor was present, it is possible that the analgesia can be implicated in the slowness of the other two babies. All eight infants were discharged in good condition. The three neonatal deaths were due to asphyxia from premature separation of the placenta, congenital malformation of the heart, and difficulty during version and extraction in an attempt to correct a transverse lie with a prolapsed arm. The three causes of death in the stillborn were erythroblastosis foetalis, asphyxia due to premature separation of the placenta with a large concealed hemorrhage, and asphyxia and intrapartum death due to a difficult breech extraction. From this analysis it is apparent that obstetrical factors other than analgesia could account for all the stillborn and neonatal deaths and for all but two of the slow *Group C* babies.

PREMATURE INFANTS

Since the depressant action of any obstetrical analgesia would be most evident among premature infants, these were studied separately. A fetal weight of less than 2,500 gm. was the criterion of prematurity. Of the 24 premature infants, 20 were classified according to their condition at delivery in Groups A and B and only four infants were in *Group C*. However, obstetrical factors other than analgesia were found to account for the slowness of respiration in all four infants. It would appear that Demerol-scopolamine analgesia has no more effect in premature infants than in those of normal weight.

CAESAREAN SECTION

Fourteen patients, delivered by caesarean section, were given 100 mg. of Demerol and 0.48 mg. (1/150 gr.) of scopolamine about an hour prior to induction of general or local anesthesia. Four operations were performed under local and

ten under general anesthesia with nitrous oxide and ether. Induction of general anesthesia proceeded quite smoothly in these patients and mucus in the respiratory passages was conspicuous by its absence. Sedation and amnesia were effective in patients who were operated upon under local anesthesia. The indications for caesarean section were:

Previous caesarean for cephalopelvic disproportion	6
Large ovarian tumor complicating pregnancy	1
Small android pelvis and large fetus.....	1
Placenta previa complicating twin pregnancy	1
Central placenta previa	1
Dystocia due to cephalopelvic disproportion with adequate trial of labor.....	4

The first eight were elective procedures and the remainder operations of necessity.

There were no maternal or fetal deaths, and of the 15 infants delivered, all but two were classified as Groups A and B infants. There were adequate obstetrical reasons to explain the slowness in the remaining two babies (central placenta previa with considerable blood loss and a difficult labor of 48 hours). The absence of anoxia was striking in these babies.

SUMMARY

1. Demerol and scopolamine were used for obstetrical analgesia in 300 patients at the Sonoma County Hospital.

2. Satisfactory sedation was produced in 86 per cent of the series, as compared with 48 per cent in the control group given barbiturates, paraldehyde and scopolamine in various combinations.

3. The average length of labor was 4.2 hours shorter in the primiparas and 2.2 hours shorter in multiparas given Demerol and scopolamine, than the average labors in the control group.

4. No untoward effects of importance were observed in the mothers. Mild transitory side effects consisted of dryness of the mouth and throat, nausea, dizziness, diaphoresis, vomiting, and excitement. The latter was observed in only 4 per cent as contrasted with an incidence of over 20 per cent in control patients treated with paraldehyde and barbiturates.

5. No depressant effects were observed in 307 full term and premature infants delivered vaginally.

6. The combination of Demerol and scopolamine provided an adequate and safe preanesthetic medication in a small group of caesarean sections. The absence of fetal anoxia was striking.

CONCLUSIONS

The combination of Demerol and scopolamine, as used for obstetrical analgesia, provides satisfactory relief of pain and amnesia, is safe for both mother and child, and is uncomplicated to administer and supervise. It is the most satisfactory analgesic combination employed in labor at the Sonoma County Hospital. For these reasons, it merits a wider trial by the medical profession.

DISCUSSION BY CHARLES A. ISHAM, M.D.:

I wish first to congratulate Dr. Maximov upon his excellent presentation. This subject has been adequately covered by his paper. There are a few points that can be emphasized.

In regard to caudal anesthesia, there is no argument but that this type of medication is very excellent, but it still remains that it is of very little practical use to the average private practitioner of obstetrics. Its use is chiefly limited to isolated cases or as a "one shot type" of terminal anesthesia. It has found an excellent use in the larger institutions where constant observation by house staff can be maintained, this being obligatory with this type of medication.

I have used Demerol for the last few years and have had a chance to watch its efficacy in labor. For this discussion four hundred cases were surveyed from Mercy Hospital in San Diego. This institution has entirely private cases, and there are no clinic patients available so that these patients were delivered by a large number of obstetricians. For this reason any statistical survey was entirely without any valid conclusions due to the smallness of the number after breakdown. Demerol was administered with every type of drug. Questionnaires were sent to these patients, all receiving them within a few months of their delivery. The main question was one regarding remembrance of facts during their labor. Twenty-seven per cent of 289 replies had a total amnesia, and upon investigation of this number it was found that the Demerol was given with barbiturates and scopolamine in those patients obtaining amnesia. Over 90 per cent, however, volunteered the information that the medicine was definitely of aid in their labor.

There were no appreciable severe reactions nor side effects from the administration of Demerol. The few reactions obtained were those of nausea and vomiting and slight dizziness which soon passed off. There were no fetal deaths that could be attributed to Demerol. The cyanotic infants obtained were definitely a result of other obstetrical complications.

There seemed to be much less of an "unruly" reaction on the part of the mother when receiving Demerol than with other types of agents, such as the barbiturates alone with scopolamine or paraldehyde. In 150 personal cases there were only seven "unruly" reactions, or an incidence of approximately 4 per cent.

We have found that the administration of secenal in 0.1 gm. or 0.2 gm. (1½ or 3 gr.) dosages and scopolamine with the first dosage of Demerol has a quieting effect and gives a very satisfactory amnesia in a large majority of cases.

DR. MAXIMOV (CLOSING)

I am aware that many writers proposing new analgesics for parturition are inclined to be enthusiastic about their particular agent. It is possible that this report has the same human failing. I would like to stress, however, that I am not advocating the use of Demerol and scopolamine to the exclusion of many other excellent anal-

gesics in common use today. Nevertheless, I am convinced that Demerol can be successfully employed in conjunction with other analgesics, or in their place, if contraindications to the other methods are present.

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Treatment of Thrombo-Embolism† By Vein Interruption

LEON GOLDMAN, M.D. and
STANLEY G. JOHNSON, M.D.*

HOMANS¹ has called attention to "bland thrombosis" of the leg veins as a common cause of pulmonary embolism. He advocated vein ligation for the prevention of embolism after the thrombus has formed. Ochsner and DeBakey² have designated this type of vein thrombosis as "phlebothrombosis" to differentiate it from acute thrombophlebitis, in which the vein wall is actually inflamed and the thrombus is more apt to be adherent. On the basis that the leg veins are the source of the embolus in 95 per cent of the cases, Allen³ has performed a large series of vein interruptions and by this procedure has lowered the morbidity and mortality rates of pulmonary embolism and the incidence of chronic edema. He has also practiced preoperative prophylactic vein interruption in patients who could not be ambulated early.

That thrombophlebitis with its attendant edema in many patients is a late change of phlebothrombosis seems likely. Pulmonary embolism may be the only sign of phlebothrombosis, or there may be foot, calf or thigh tenderness, positive Homan's sign, slight cyanosis, mild edema, or evidence of vasospasm. Embolism is most apt to occur during the early stage and can be prevented by vein interruption. The picture of phlegmasia alba dolens is usually associated with edema, pain, fever and leukocytosis and, while the danger of embolism is not as great, the edema is more likely to persist than when associated with phlebothrombosis.

During the 26-month period between November 1, 1943, and December 31, 1945, 71 cases of thrombo-embolism were encountered on the University of California service at the San Francisco City and County Hospital. As indicated in Table 1, 25 of these patients had ligation of the iliofemoral venous system, 30 were treated by other means than ligation, and 16 of the cases were not diagnosed until autopsy and were not treated. The sex distribution was practically

equal, there being 35 males and 36 females. The ages ranged from 21 to 83, the average age being 54. Forty-six per cent occurred in the sixth decade, which again emphasizes the fact that advanced age, with its infirmities, is a predisposing factor to thrombo-embolism.

TABLE 1.—71 Cases Thrombo-embolism at S.F.H.
Nov. 1, 1943 to Dec. 31, 1945

Ligated	25
Nonligated	30
Thrombo-embolism at autopsy	16
Total	71
Male	35
Female	36
Age	21-83
Average age	54

Forty-three, or 60.6 per cent, of the 71 cases appeared on the medical service and 28, or 39.4 per cent, on the surgical service, as shown in Table 2. Of the 25 ligated cases, 13 were from the medical service and 12 from the surgical service.

TABLE 2.—Distribution of 71 Cases Thrombo-embolism
S.F.H. Nov. 1, 1943 to Dec. 31, 1945

	Medical Service	Surgical Service
Ligated cases	13	12
Nonligated cases	18	12
Autopsy cases	12	4
Total	43 or 60.6%	28 or 39.4%

Thrombo-embolism occurred postoperatively in 11 of the cases in this series, as shown in Table 3. In Table 4 is seen a list of the primary diagnoses in these 71 cases of thrombo-embolism. A review of these will emphasize the variety of illnesses that may be complicated by thrombo-embolism. As has been repeatedly pointed out, cardiovascular disorders rank high as predisposing factors in

TABLE 3.—Postoperative Cases in 71 Cases Thrombo-embolism S.F.H. Nov. 1, 1943 to Dec. 31, 1945

Gastric resection	2
Appendectomy	1
Oophorectomy	1
Cecostomy	1
Hernioplasty	1
Cesarean section	1
Abdominoperineal resection	1
Removal placenta	1
Drainage intra-abdominal abscess	1
Excision sarcoma leg	1
Total	11

* From the Department of Surgery of the University of California Medical School, and the University of California Surgical Service of the San Francisco Hospital, Division of the Department of Public Health.

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the development of thrombosis. Trauma, malignancy, and acute and chronic infectious processes contribute generously. Among those having cardiovascular disorders were 15 with arteriosclerotic heart disease associated with failure, four with coronary artery disease, five with rheumatic heart disease associated with failure, and two with luetic heart disease. Twenty patients in this group had severe cardiac failure at the time of development of the venous thrombosis.

TABLE 4.—Primary Diagnosis in 71 Cases Thromboembolism S.F.H. Nov. 1, 1943 to Dec. 31, 1945

Fracture tibia	1
Trauma	5
Severe burns	2
Cellulitis thigh	2
Varicose ulcer	1
Ca esophagus	1
Ca sigmoid	2
Lymphosarcoma	2
Sarcoma	1
Ca cervix	1
Cirrhosis	2
Malnutrition & cachexia	1
Visceral angitis	1
Rheumatic heart disease with failure	5
Coronary occlusion	4
Arteriosclerotic heart disease with failure	15
Luetic heart disease	2
Arteriosclerotic gangrene extremity	2
Pneumonia	4
Diabetes	1
Pulmonary tuberculosis	2
Tuberculous peritonitis	1
Senile psychosis	2
Pregnancy & eclampsia	1
Asthma	1
Abdominal aortic aneurysm	1
Anemia	1
Bronchiectasis	1
Gastric ulcer	1
Superficial thrombophlebitis	1

Mechanical trauma to the lower extremity with direct or indirect injury to the vessels was the causative factor in five patients. Venous thrombosis occurred following a period of bed rest in two patients having rather severe burns, of the extremities in one instance and the buttocks in the other. There were seven patients with malignancy and 11 with either acute or chronic infectious processes.

Table 5 shows the incidence of pulmonary embolism to be 48, or 67.6 per cent. In the group of 25 cases in which vein ligation was done, 20 patients, or 80 per cent, had pulmonary embolism.

TABLE 5.—Incidence of Pulmonary Embolism in 71 Cases Venous Thrombosis S.F.H. Nov. 1, 1943, to Dec. 31, 1945

	Cases	Embolism	Percentage
Ligated	25	20	80.0
Nonligated	30	15	50.0
Autopsy	16	13	81.2
Total	71	48	67.6

Of these, 15 patients had a single pulmonary embolus prior to ligation and five had multiple emboli. Two patients had a single small pulmonary embolus which occurred after bilateral ligation of the iliofemoral venous system; they were then treated with anticoagulants.

In this group of 25 ligated patients, three deaths were attributable to pulmonary embolism (Table 6). One patient who experienced a massive pulmonary embolism while undergoing

phlebotomy with attempted aspiration of an adherent thrombus expired six hours postoperatively. If iliac vein ligation had been done proximal to the thrombus in this patient, this fatal embolus might have been averted. If thrombophlebitis rather than phlebothrombosis is found, removal of the thrombus should not be attempted. Two other patients had had multiple pulmonary infarcts before ligation with development of a cor pulmonale and cardiac failure with subsequent death. Earlier ligation undoubtedly would have prevented infarction and subsequent cardiac embarrassment.

TABLE 6.—Deaths Attributable to Pulmonary Embolism in 71 Cases Venous Thrombosis S.F.H., Nov. 1, 1943, to Dec. 31, 1945

	Cases	Deaths
Ligated	25	3
Autopsy	16	6
Nonligated	30	7
Total	71	16

Pulmonary embolism occurred in 15 patients, or 50 per cent, who had no vein interruption. Ten of these had a single embolus and five had multiple emboli. Of the 15 patients who had pulmonary embolism, three expired from a single massive embolus. One of these expired 25 minutes after a paravertebral block and one died two days after a paravertebral sympathetic block. One patient who clinically had thrombosis of an external jugular and a brachial vein, together with bilateral thrombosis of the deep veins of the lower extremities, died from a massive embolus, the source of which was not determined. Another patient expired several days after the occurrence of a single large pulmonary embolus which contributed much to his cardiac failure and death. Of the five patients who had had multiple pulmonary emboli, two expired from cardiac failure secondary to development of a cor pulmonale and one from a massive embolus occurring during a thoracentesis. Of the 15 patients having had pulmonary embolism, seven, or 47 per cent, expired either from a massive embolus or from cardiac failure brought on by encroachment upon the pulmonary arterial tree by multiple emboli.

Of the 16 cases found to have thromboembolism at autopsy 13, or 81.1 per cent, had had pulmonary embolism. Of these 13 cases, five, or 31.1 per cent, had had a single fatal pulmonary embolus and in another case there had been a large pulmonary embolus that contributed to cardiac failure. In the seven remaining cases the infarctions probably contributed to but may not have been the major factor in the cause of death.

In the 55 cases that were clinically diagnosed the treatment consisted of conservative measures in 20, paravertebral sympathetic block in eight, anticoagulants in two, and iliofemoral venous ligation in 25.

As shown in Table 7, 43 vein ligations were carried out in 25 patients. Of these 43 ligations, 33 were carried out on the superficial femoral

vein, five on the common femoral, four on the external iliac, and one on the common iliac. Fourteen of the 25 cases had immediate bilateral ligation, a bilateral superficial femoral vein ligation being done in ten, ligation of the external iliac vein on one side and the superficial femoral vein on the other in three, and of the common femoral vein on one side and the superficial femoral vein on the other in one case.

TABLE 7—*Ligations in 71 Cases Thrombo-Embolism S.F.H. Nov. 1, 1943, to Dec. 31, 1945*

Ligated cases	25
Ligations	43
Immediate bilat	14
Double ligation	1
Vein ligated	
Superficial femoral	33
Common femoral	5
External iliac	4
Common iliac	1

In 16, or 37 per cent, of the 43 vein ligations, a thrombus was encountered at the site of ligation. Ten of the thrombi were nonadherent and of the "bland" variety, and two were adherent to the intima. In four instances a thrombus was present but the vein was not opened. In one of these cases the thrombus was definitely adherent, and in the others it was probably nonadherent as determined by the operative description of the vein. In 11 of these 16 cases in which a thrombus was encountered at the site of ligation a phlebotomy with aspiration of the thrombus proximal to the opening was carried out with subsequent adequate backflow. This procedure was carried out on the superficial femoral vein in six instances, the common femoral vein in four and the external iliac in one case. In eight cases the thrombus in the vein distal to the opening was also aspirated in an attempt to improve the return of collateral circulation.

In the patients having had ligation of the superficial femoral vein minimal edema of the lower extremity was present at the time of discharge from the hospital in six instances, or 18 per cent of the 33 ligations. Of five patients with ligations of the common femoral vein two, or 40 per cent, showed moderate to minimal edema. Of those with external iliac ligations two, or 50 per cent, showed moderate edema, and the patient with common iliac ligation had persistent diminishing edema for several months postoperatively. The edema was improving in all the patients at the time of their discharge from the hospital. There were no instances of lymphorrhea.

It should be emphasized that the likelihood of postligation edema depends largely on the extent of the thrombosis or thrombophlebitis, the degree of collateral venous and perivascular involvement, the presence of vasospasm, the duration of the thrombosis, and a history of previous phlebitis. These factors seem more important to us than the ligation itself. Ligating a patent vein with open collaterals seldom produces edema, but the obstruction of main venous channels and their collaterals without ligation usually results in edema. This further justifies the removal of

bland thrombi *early* while the process is still limited to the femoral or leg veins.

OPERATIVE TECHNIQUE

Femoral Vein Exploration.—In the majority of instances 1 per cent procaine hydrochloride infiltration locally is used. When there is no contra-indication in patients with marked vasospasm, low spinal anesthesia is chosen. A longitudinal incision is made from the crease of the groin distalward over the course of the pulsating femoral artery and carried down through the subcutaneous fat and fascia. The saphenous vein is usually encountered and if it is normal is retracted medially, together with the subcutaneous layers, to expose the femoral vessels (Fig. 1). If the saphenous vein is thrombosed, it is ligated and divided above the proximal extension of the thrombus. The femoral artery overlies the lateral portion of the femoral vein. The femoral sheath is incised along the medial aspect of the femoral artery, which is then freed from the femoral vein and gently retracted laterally about 4 centimeters inferior to the inguinal ligament.

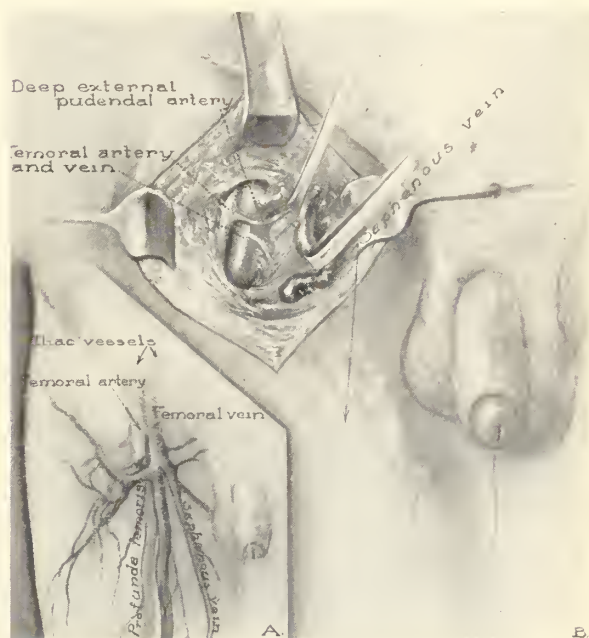


Fig. 1. Incision in thigh showing approach to femoral vein.

The deep femoral vein enters the posterior lateral aspect of the superficial femoral vein (Fig. 2). The pathological findings, if any, are then observed. The superficial femoral vein is freed for a distance of 2 to 2.5 centimeters distally by sharp and gentle dissection. Two double strands of number 40 cotton are passed about this freed segment of vein and are held by hemostats at the proximal and distal ends. A transverse incision is then made through the anterior wall of the vein in the central portion of the freed segment. If no thrombus is present at this level, bleeding will be profuse from above and below. If a thrombus is present it will partially extrude itself. Suction is then applied to the thrombus

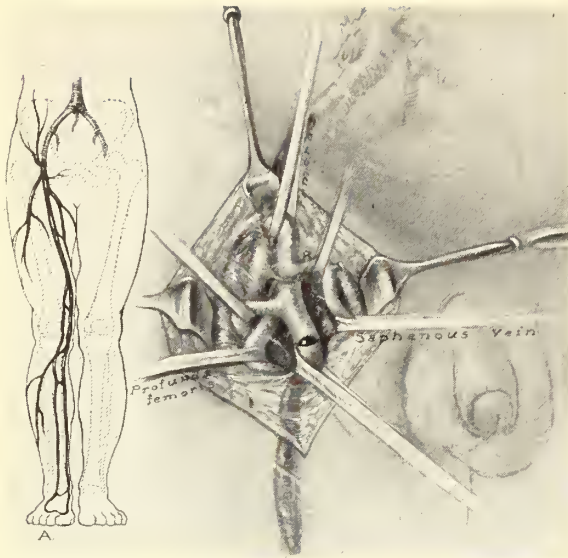


Fig. 2. The dissection is carried further and the thrombus is exposed by an incision made in the superficial femoral vein.

through an angulated glass tube, evacuating it from the proximal segment of the vein (Fig. 3). When this has been accomplished the vein will readily collapse and free back bleeding will occur. The proximal ligature is then tied. As much of the thrombus as possible is aspirated from the distal segment of the vein. This is sometimes facilitated by applying suction through a fairly small urethral catheter, which often can be passed farther distally in the vein than the angulated glass tube. Clearing of the distal segment is important in opening numerous tributaries, thus increasing the collateral circulation and decreasing the subsequent edema of the extremity.

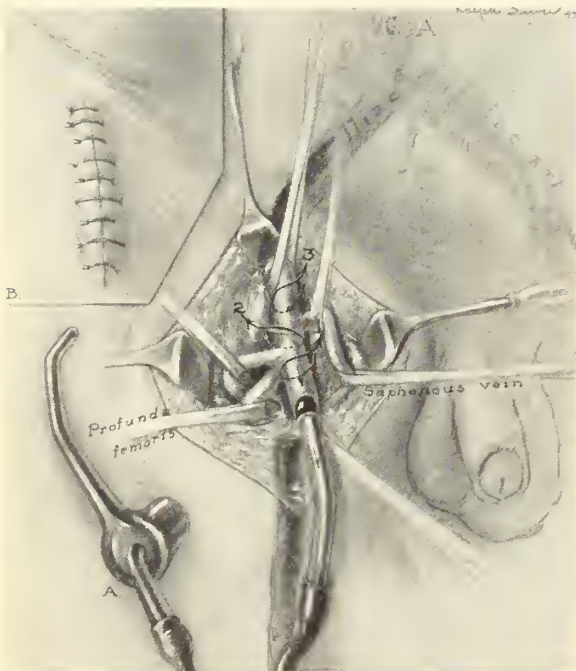


Fig. 3. Aspiration of the thrombus from the superficial femoral vein.

The distal ligature is then tied, the vein completely severed, and each end transfixed with a double number 40 cotton suture distal to the ligature.

This same procedure is carried out on the superficial femoral vein, when a noninflammatory thrombus is present within it or as high as the proximal portion of the common femoral vein. However, if in addition to involvement of the superficial femoral vein, there is a thrombus within the deep femoral vein, the common femoral vein is ligated. In the common femoral vein anatomical variations are exceedingly common and several small tributaries are given off just proximal to its junction with the deep and superficial femoral veins. It is necessary here to use careful, gentle technique to avoid damage to these tributaries, which may serve as important collateral channels after the ligation, and bleeding from which may obscure the field and make the dissection more difficult. The common femoral vein is freed distal to its junction with the saphenous

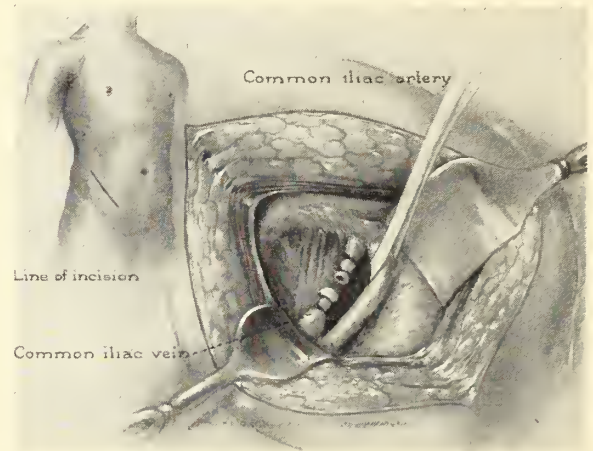


Fig. 4. Incision and dissection for extraperitoneal ligation of common iliac vein.

nous vein and traction ligatures are placed about the freed segment which is then opened. The thrombus is aspirated from each segment, and ligation, division and transfixion are carried out as previously described. The wound is irrigated with isotonic solution of sodium chloride and closed in layers without drainage, using interrupted sutures of fine cotton.

Iliac Vein Exploration.—In patients with a relatively long-standing process and in whom a clinical diagnosis of ilial thrombophlebitis has been made, an extraperitoneal approach to the iliac veins is carried out. If exploration of the femoral region reveals an adherent thrombotic process which extends proximal to the common femoral vein, that wound is closed and the common iliac vein exposed through the approach to be described. Under low spinal or inhalation anesthesia an oblique incision is made parallel with, and just above and medial to, the inguinal ligament (Fig. 4). The aponeurosis of the external oblique muscle is divided in line with the incision, and the fibers of the internal oblique and transversalis muscles are spread to allow entry

to the extraperitoneal space. The peritoneum is mobilized superiorly and medially to expose the external and common iliac veins. Simple ligation of the common iliac vein above the proximal extension of the thrombus is carried out. Ligation of the common iliac is preferable to division of the external iliac vein because of the better collateral circulation provided through the hypogastric vein. The common iliac artery is mobilized and retracted slightly medially on the right side and laterally, when exploration is done on the left side. A small segment of the common iliac is freed posteriorly and medially until a curved clamp can be inserted posterior to it at a point proximal to the extension of the thrombus. A double ligature of double number 40 cotton is then placed about it and tied to completely occlude the vein. Obviously the dissection and ligation must be done with extreme care to avoid tearing of the vein. The wound is closed in layers without drainage with interrupted sutures of fine cotton.

If it is necessary to ligate the inferior vena cava because of extensive bilateral thrombosis involving both common iliac veins, or extending well into the vena cava from one side, a similar approach is used on the right side, the incision being placed somewhat higher than for ligation of the common iliac vein.

When a diagnosis of phlebothrombosis or thrombophlebitis is made, a bilateral ligation is carried out at the appropriate level, even though definite clinical signs may exist in only one extremity. We have occasionally been amazed to find a rather far advanced thrombosis in the femoral vein of a clinically normal extremity. This procedure is carried out in patients who have had pulmonary embolism, even though there may be no evidence of thrombosis of the lower extremities.

Postoperatively these patients are allowed out of bed immediately if their primary disease does

not contra-indicate ambulation. Constant support is provided in the form of elastic bandages from the toes to the knee and these are worn until edema no longer develops as a result of activity. Anticoagulant therapy is used only in the occasional patient in whom pulmonary embolism recurs after a bilateral ligation. If persistent vasospasm is present, paravertebral sympathetic injections of procaine are given at intervals until the vasospasm is relieved.

SUMMARY

1. Ligation or interruption of the iliofemoral veins is a life-saving procedure in patients who have had pulmonary embolism.

2. This should be carried out early in order to prevent extension of the thrombus into the pelvic veins with resultant phlegmasia alba dolens and persistent edema.

3. Vein ligation should not be postponed until the patient has had multiple pulmonary infarctions.

4. Bilateral, rather than unilateral, ligation is preferable because the pathological process may be symmetrical even though there are no clinical findings in one extremity.

5. In patients with adherent vein thrombosis (thrombophlebitis) ligation should be done proximal to the thrombus.

6. Edema is no more marked in the ligated than the unligated cases and is usually lessened if ligation is carried out early.

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ARMY PHYSICAL RECORDS POINT TO DANGER OF OVERWEIGHT

Overweight, emotional elevations of the blood pressure and acceleration of the heart beat are the forerunners of serious illness, according to four investigators writing in the July 20 issue of *The Journal of the American Medical Association*.

The investigators, Robert L. Levy, M.D., of New York, Paul D. White, M.D., of Boston, William D. Stroud, M.D., of Philadelphia and Brig. Gen. Charles C. Hillman, United States Army, studied the medical records of 22,741 army officers which contained the results of annual physical examinations made between January, 1924, and December, 1941.

The authors predict from their study that overweight

associated with the temporary elevations of blood pressure and rapid heart beat will lead eventually to the development of high blood pressure and diseases involving the heart, blood vessels and kidneys.

A group of men who during the period of study showed none of the predisposing factors were observed in comparison. The study reveals that the later development of high blood pressure was 12 times as great in the overweight group as in the comparison group. In the case of retirement from duty because of diseases involving the heart, blood vessels and kidneys, the rate was four times as great.



The Coccidioidin Skin Test In The Panama Canal Zone

RESULTS OF A BRIEF SURVEY IN TUBERCULOUS AND NON-TUBERCULOUS PATIENTS*

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NO previous effort has been made to determine the prevalence of infection in man with *Coccidioides immitis* in the Panama Canal Zone by means of the coccidioidin skin test. With the exception of one clinical case of pulmonary coccidioides infection,¹ probably imported, there is no evidence that the fungus occurs in this region. Tuberculosis, on the other hand, has been the principal cause of death from disease in nearby Panama City. The annual mortality rates, 1937-1941, averaged 1.51 per 1,000.² This situation invited investigation in the light of the opinions expressed by some that this test may give false or cross reactions in patients with active tuberculosis (see Strong³ for summary of literature). Although this work was interrupted before a large series of patients could be tested, the results obtained seemed of sufficient interest to justify this brief report.

MATERIAL AND METHODS

A total of 154 colored patients from the medical wards of Gorgas Hospital, Ancon, Canal Zone, were skin tested. Each was required to have no history of such allergic conditions and diseases as asthma and hay fever and to have never traveled to the United States. Fifty-one were individuals with laboratory and roentgenologic proof of active pulmonary tuberculosis. One hundred and three were patients with various medical illnesses selected with regard to freedom from tuberculosis. Thorough clinical examinations were performed in all cases for this purpose, laboratory and roentgenologic procedures were employed in all known tuberculosis contacts and wherever suggestive physical findings were noted.

The antigen used in this study was prepared by Dr. J. F. Kessel, Chief Microbiologist, the Los Angeles County General Hospital, and shipped via air mail. Its potency on arrival was confirmed on a patient known to have reacted to the antigen when tested previously elsewhere. Except when the tests were being performed, this material was kept under refrigeration. In all instances a 1:100 dilution of coccidioidin antigen in merthiolated saline (1:10,000) was used. After cleansing the flexor surfaces of the forearms, 0.1 cc. of diluted antigen was given intradermally

in the right forearm and a control injection of merthiolated saline in the left. Reactions were read at the end of 48 hours and the standards were those generally accepted for the tuberculin skin test.

New needles and syringes were obtained for this study. After use they were washed in distilled water, 70 per cent alcohol, and packed separately in labeled glass tubes in order to prevent interchange of control and test equipment. The cotton-plugged tubes were autoclaved prior to use.

CLINICAL DATA

The majority of these patients came from urban centers, especially Panama City and Colon. Occupational categories were few: housewife, maid, laborer, clerk; two were seamen.

Among the patients with active tuberculosis, 40 were males, 11 were females; the heterogeneous group was composed of 81 males, 22 females.

The predominant races were Panamanian mestizos, of mixed white and Indian ancestry, and West Indian Negroes; Chinese, South and Central Americans were also represented. The relationship of race to tuberculosis was as follows:

	Tuberculous	Non-tuberculous
Panamanian mestizos.....	25	33
West Indian Negroes.....	14	64
Others	12	6

The age distribution of the groups under consideration is shown in the following lists:

	Tuberculous	Non-tuberculous
11 - 20 years	8	13
21 - 30 years	15	20
31 - 40 years	11	17
41 - 50 years	6	12
51 - 60 years	5	28
61 - 70 years	6	7
71 - 80 years		5
81 - 90 years		1

RESULTS

With one exception, every test was negative. In eight of the non-tuberculous patients minor reactions varying from slight erythema to recognizable induration were noted. Patients with active tuberculosis showed no response whatever to the antigen; eight of them had previously been tested with tuberculin with positive reactions. (Most

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had moderately or far advanced disease, making it unwise to perform routine tuberculin tests.)

The single individual giving a positive coccidioidin skin test reaction was a 60-year-old Barbadian male, a resident of Panama City, who had entered Gorgas Hospital because of coronary heart disease with myocardial infarction and generalized arteriosclerosis. There was no evidence of tuberculosis after clinical, laboratory and roentgenologic studies; the tuberculin reaction was one-plus positive. His reaction to coccidioidin consisted of a papule measuring 5.0 millimeters and an areola of erythema 10.0 millimeters in diameter. He was recalled four months after the original test for a second injection of coccidioidin. The reaction was again positive.

COMMENT

The number of tests performed in this study is too small to warrant definite conclusions. These results are, however, compatible with the apparent absence of autochthonous coccidioid disease in this region. Negative coccidioidin tests usually exclude the possibility of infection.⁴

The single positive test probably tends to assume too great an importance because of the

small total number of observations in this series. No explanation for this exception is forthcoming. Positive coccidioidin reactions have been reported previously in patients with no known infection with *C. immitis*.⁵

In agreement with the opinions of other investigators^{6,7} evidence suggesting false or cross reactions to coccidioidin in patients with active pulmonary tuberculosis was not found.

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POLIOMYELITIS IN SAN FRANCISCO

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IN the period from 1930 to 1945, there have been four intervals in which the incidence of poliomyelitis has reached an epidemic stage—1930, 1934, 1943 and 1945. Prior to 1930 increased incidence had occurred with rather definite regularity at intervals of from two to two and one-half years. After 1930, the intervals between epidemics were longer and more irregular.

Both the 1930 and 1934 epidemics in San Francisco have been reviewed at length by this department.^{1,2} Discussions on the possibility of the spread of poliomyelitis as a result of direct personal contact and on the use of convalescent serum are also in publication.^{3,4} So far as 1945 is concerned there were quarantined for a period of two weeks, 110 contacts of diagnosed cases, 53 of which were in the age groups 0-6 years; 37 in the age groups 6-12 years and 20 in the age group 12-18 years. Moreover, mothers were given permission to do the necessary shopping for family supplies including food, and wage earners were allowed to work provided they did not work with food or children. In this quarantine group (110) and in all others so involved no case of poliomyelitis developed.

In this report which has been extended to cover the elevated incidence of 1943 and 1945, certain comparative data are presented for further analysis.

In Table 1 an attempt has been made to present significant comparative detail for each of the four years above mentioned. Attention is invited to certain similarities and differences occurring in these figures. In each of the first three years, the progress of the reported local incidence followed approximately the same pattern—a rather abrupt beginning rise continuing to a peak, and then a sudden decline and disappearance of reported cases. The record for 1945 is one of fluctuating reports. The first two epidemics were of much shorter duration than either of the last two.

The number of non-local cases shows a definite increase through the four epidemics reaching a high level in 1945. In 1930 the non-local cases were 14 per cent of all cases reported, in 1934, 18 per cent. In 1943 they were 55 per cent of the total and by December 1, 1945, the figure had reached 60 per cent. The probabilities are either that improved methods for hospital care had been established in San Francisco or that the statewide simultaneous outbreaks in 1943 and 1945 occurred in areas in closer proximity or in those without adequate hospital facilities. Table 7 indicates the areas from which non-local cases were received in San Francisco. The percentages of non-residents in the total deaths from poliomyelitis also show increases in the same years although the figure for 1943 is higher than that for 1945.

A tabulation on onset dates, Table 2, tends to support the opinion arrived at in Table 1, that

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there is apparently no fixed or predictable seasonal incidence in these periods of so-called epidemics.

TABLE 1.—*Poliomyelitis*

	1930			1934		
	Cases		Deaths	Cases		Deaths
	Local	Non-Local		Local	Non-Local	
January ..	1	0	0	1	0	1
February ..	0	0	0	2	0	0
March	1	0	0	0	0	1
April	0	0	0	1	1	0
May	0	0	0	3	1	2
June	3	0	1	74	12	8
July	7	4	0	26	4	1
August	24	10	6	13	4	1
September ..	68	3	7	2	0	0
October ..	81	10	7	0	0	0
November ..	29	6	2	0	3	1
December ..	16	5	4	0	2	0
Totals	230	38	*27	122	27	**15
*Includes 6 non-residents				**Includes 5 non-residents		
22%				35%		
Period of epidemic—August-December				June-August		
Peak—October				June		
Morbidity rate /100,000			35.91	17.7		
Mortality rate /100,000						
on total deaths.....			4.2	2.2		
on resident deaths only			3.3	1.5		
	1943			1945		
	Local	Non-Local	Deaths	Local	Non-Local	Deaths
January ..	0	1	0	3	1	0
February ..	1	0	0	0	1	0
March	1	0	0	0	1	0
April	0	0	0	1	0	0
May	5	2	1	0	1	0
June	7	15	4	5	13	0
July	12	33	3	10	24	0
August	28	37	2	9	19	3
September ..	20	32	1	18	19	2
October ..	36	23	2	13	25	3
November ..	28	20	0	23	21	0
December..	4	10	0			
Totals	142	173	*13	82	125	**8
*Includes 11 non-residents				**Includes 5 non-residents		
84%				62½%		
Period of epidemic—June-November				June-November		
Peak—October				to date November		
Morbidity rate /100,000			18.3	10.8		
Mortality rate /100,000						
on total deaths.....			1.7	1.1		
on resident deaths only			0.3	0.5		

TABLE 2.—*Local Cases—By Onset Dates*

	1930	1934	1943	1945
January	0	1	0	2
February	1	1	1	0
March	0	1	0	0
April	0	2	1	2
May	2	12	6	2
June	3	79	6	4
July	10	26	22	9
August	27	0	25	8
September	72	0	21	21
October	78	0	37	16
November	25	0	24	16
December	12	0	1	0

In an attempt to associate climatic conditions with increased incidence of poliomyelitis, mean temperatures and total rainfall in inches for San Francisco during those months in which epidemics persisted are shown in Table 3. A study of this tabulation discloses that in each year the peak of cases both by date of reporting and date of onset occurred within a period when the annual maximum mean temperature had been reached. Extreme maximum temperatures were found on October 6, 1930 (92 degrees) the month in which the epidemic of that year had reached its peak, again on June 29, 1934 (95 degrees) a peak month in that epidemic, and on September 21, 1943 (96 degrees) a trifle earlier than the peak of the epidemic. The year 1945 did not have at any time a period of extreme maximum temperatures. However, the highest temperature for the year was reached in June (87 degrees) another high temperature of 85 degrees in September, 83 degrees in October and 82 degrees in November, all months in which cases of poliomyelitis beyond a normal expectancy were reported. It is further noted that the monthly mean temperatures in 1945 were considerably higher than for the corresponding months in the other years. Monthly precipitation may not be an important factor. The table indicates only the anticipated seasonal increases in rainfall and these do not coincide significantly with increases in the incidence of poliomyelitis.

A slight change in sex distribution is indicated in Table 4. In the earlier epidemics the males were considerably in excess of the females, the ratio gradually shifting until in 1945 the reverse is true.

The median age in local cases increased in the 15 years over which these epidemics occurred. The percentage of adults in local groups ranged from 19 to 26, the highest and lowest percentages occurring in 1943 and 1945, respectively (Table 5). There is somewhat of interest in the tabulation of cases hospitalized (Table 6). In the epidemic of 1930, cases were distributed for care among many of the local hospitals. By 1945, the entire burden had fallen upon Children's Hospital and the Isolation Division of the San Francisco Hospital for both local and non-local cases.

TABLE 3

		Mean Temperatures				Rainfall		
	1930	1934	1943	1945	1930	1934	1943	1945
June		61.0	57.4	61.3		0.68	0.13	0.01
July		60.0	59.0	64.1		0.01		
August	61.5	60.9	59.8	64.1				
September	62.4		63.4	69.2	0.10		0.02	0.04
October	63.2		61.2	67.5	0.89		0.74	1.95
November	58.0		59.0	61.4	1.56		0.80	3.24
December	52.2				0.98			

TABLE 4.—*Sex*

	1930			1934			1943			1945		
	M	F	T	M	F	T	M	F	T	M	F	T
Local cases	145	85	230	65	57	122	73	69	142	39	43	82
Non-local cases	24	14	38	13	14	27	102	71	173	69	56	125
Deaths	14	13	27	8	7	15	6	7	13	5	3	8
Rates females to males in local cases	1:1.7			1:1.4			1:1.06			1:0.9		

TABLE 5.—Age

	1930		1934	
	Local	Non-Local	Local	Non-Local
Under 1 year....	2	0	1	0
1 - 4 years	47	5	13	2
5 - 9 years	84	12	34	7
10 - 14 years	37	9	36	5
15 - 19 years	9	5	13	4
Adult	51	7	25	9
Adult group in local cases—22% of total			20% of total	
Median age in local cases—8 years			11 years	
	1943		1945-Dec. 1	
	Local	Non-Local	Local	Non-Local
Under 1 year....	8	2	1	1
1 - 4 years	19	35	12	34
5 - 9 years	45	37	25	32
10 - 14 years	25	40	12	19
15 - 19 years	14	21	16	6
Adult	37	28	16	33
Adult group in local cases—26% of total			19% of total	
Median age in local cases—10 years			11 years	

Most of the non-local cases in the epidemics of 1930 and 1934 came from San Mateo County. In 1943, Solano, Santa Clara, Marin and Contra Costa as well as San Mateo were sending patients into local hospitals. In the current series of cases, Marin and Solano counties alone are responsible for nearly 50 per cent of the non-local cases hospitalized locally. This obvious and general geographic concentration may have many humanitarian and excellent clinical aspects but may present some local epidemiologic hazards, even under the best controlled conditions for handling virus diseases of this type.

In the first eleven months of 1945, there were four local families in which multiple cases occurred, the onset being usually of only a few days intervening from the original cases. Of non-local families seven have had more than one case. In three areas in the city there has been a definite concentration of cases, of no more, however, than three cases to one ordinary city block. Preliminary sanitary investigation of districts in which several cases of poliomyelitis occurred during

1945 indicated that the fly problem was non-existent or slight and apparently unimportant; there was not any mosquito breeding; and in the matter of sewage, in two districts there was sewage overflow of the manholes directly in front of the homes in which cases occurred. This, however, was immediately corrected.

Of the cases in this series, 21 were clinically considered non-paralytic poliomyelitis; 13 cases recovered without residual paralysis and 32 cases had some form of residual paralysis. Data as to the remaining group of cases are still being sought.

TABLE 7.—Counties of Residence

Counties	Non-Local Cases			To Dec. 1, 1945
	1930	1934	1943	
Alameda		5	7	10
Butte			9	4
Calaveras			1	
Colusa	1		1	
Contra Costa			16	4
Glenn			1	
Humboldt	1			
Lake	3			
Lassen			1	
Los Angeles			2	
Marin	2	4	16	39
Mariposa			1	
Merced	1			1
Monterey	1			1
Napa	1	1	3	6
Nevada				1
Placer	1			
Sacramento		4	1	
San Joaquin			1	
San Mateo	12	6	13	4
Santa Clara	2	2	19	3
Santa Cruz	1		1	2
Shasta			7	
Siskiyou			2	1
Solano		1	22	28
Sonoma	2	2	3	
Stanislaus			5	3
Sutter			2	5
Tuolumne			1	
Yolo			4	1
Yuba			4	6
Out of state.....	1	1	6	
Local address with non-local infection	9	1	24	6

TABLE 6.—Hospitalization

	1930		1934		1943		1945-Dec. 1	
	Local	Non-Local	Local	Non-Local	Local	Non-Local	Local	Non-Local
At home	51	5	2	0	15	2	0	0
In Hospitals	179	33	111	27	127	169	81	123
No statement			9			2	1	2
Hospitals								
Children's	87	23	33	13	55	129	42	93
Isolation	47	2	46	5	61	28	38	26
Dante	6		1					
Franklin	2							
French	4		4	2			1	
Letterman	4			1	1	8		4
Mary's Help			1					
Mt. Zion	4	1	2					
St. Francis	1		2					
St. Joseph's	1							
St. Luke's		1	2					
St. Mary's	5		4			1		
Shriners'					1			
Southern Pacific				1				
Stanford	12	4	9	3	2	1		
U.C.	2	2	5	1	3	1		
U. S. Marine				1		1		
Outside hospitals					4			

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California Public Health Laboratories And Their Services to Physicians*

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THE laboratory of the California State Department of Public Health is now 41 years old. It was established by legislative act on July 1, 1905. During the first three years of its existence diagnostic tests for diphtheria constituted the major portion of the work done. In fact, 69 per cent of the 7,254 examinations made in the 1906-1908 biennium were for diphtheria, and most of the remainder were for typhoid fever. In 1908 diagnostic services for gonorrhea, tuberculosis and rabies were added. In 1909 a branch laboratory was established in Los Angeles, a second branch in Fresno in 1910 and a third in Sacramento in 1912.

In 1912 the State Board of Public Health ruled that routine examination service privileges of the State laboratory should be limited to cities having populations of 25,000 or less. Thereby was established the basic policy of developing local public health laboratory facilities. As local laboratories were developed in Los Angeles, Fresno and Sacramento, the State laboratory closed its branch laboratories and began entering the field of inspection and approval of local public health laboratories. This inspection and approval was formally authorized by law in 1927.

Examination and certification of laboratory technicians was begun in 1930 upon authorization by the State Board of Public Health. Examining and licensing of clinical laboratory technicians and certification of public health laboratory technicians was authorized by legislative act in 1937.

Throughout the period from 1905 to the present there has been a gradual expansion of the laboratory services provided to physicians of the State by the State and local public health laboratories. This expansion has been both in volume of work done and in the diversity of the services offered.

There are now 32 local public health laboratories plus seven branches of local public health laboratories in addition to the State laboratory that are providing services designed to protect the health of the people of California.

During 1945 this total laboratory system reported 1,297,774 examinations in a wide variety of fields.

The services of the State laboratory and the local public health laboratories are closely integrated, so closely, in fact, that from a practical standpoint there is in reality one statewide labora-

tory system. This despite the fact that each local laboratory is under the administrative supervision of the respective local health officer.

The close correlation of services is brought about in several ways. Probably the most important single factor is the unique spirit of cooperation existing between the personnel in the State and local laboratories. A considerable number of the technical personnel in the local laboratories have actually worked in the State laboratory and are consequently familiar with State laboratory policies and procedures.

A second factor is the consultative service provided by the State laboratory, both by direct visits to local departments and by mail and telephonic communications.

The legal authority upon which this coordinated service rests is contained in one brief section (Section 1002) of the Health and Safety Code which provides that local laboratories shall employ only technical personnel and use only equipment approved by the State Department of Public Health. Under its general regulatory powers and the provisions of this section of the law, the State Board of Public Health has adopted regulations that spell out the relationship in more specific terms. These regulations may be briefly summarized as follows:

"Section 1: Each local health department shall have available the services of an official public health laboratory. The laboratory of the State Department of Public Health is hereby designated as the official laboratory for all local health department jurisdictions not covered by local laboratory service."

How the public health laboratory services are distributed geographically between the State and local laboratories is shown in Figure 1. The State laboratory provides direct service in 36 counties comprising a population of 1,369,320 or 14.8 per cent of the total State population.

Thirty-two local public health laboratories provide the routine services throughout the area represented by the unshaded portion of the map. The completeness of this local service varies to some extent. In some counties (as Solano County) and some cities (as Berkeley and Richmond) the State laboratory still does the serology. In other instances the rabies examinations and various other procedures that may be considered routine are done in the State laboratory. Just how extensive this interchange of services becomes will be evident from data presented later in this paper.

There are a number of special procedures that are offered only by the State laboratory such as

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diagnostic tests for virus diseases, phage typing of *E. typhosa*, Salmonella typing, etc. These special services will be enumerated and discussed in more detail in later paragraphs.

Section 2 of the regulations requires that local laboratories have certificates of approval.

Section 3 requires periodic reports from laboratories, including monthly statistical reports of tests performed and reports of any personnel changes.

Section 4 enumerates in general terms minimum requirements for approval, including ade-

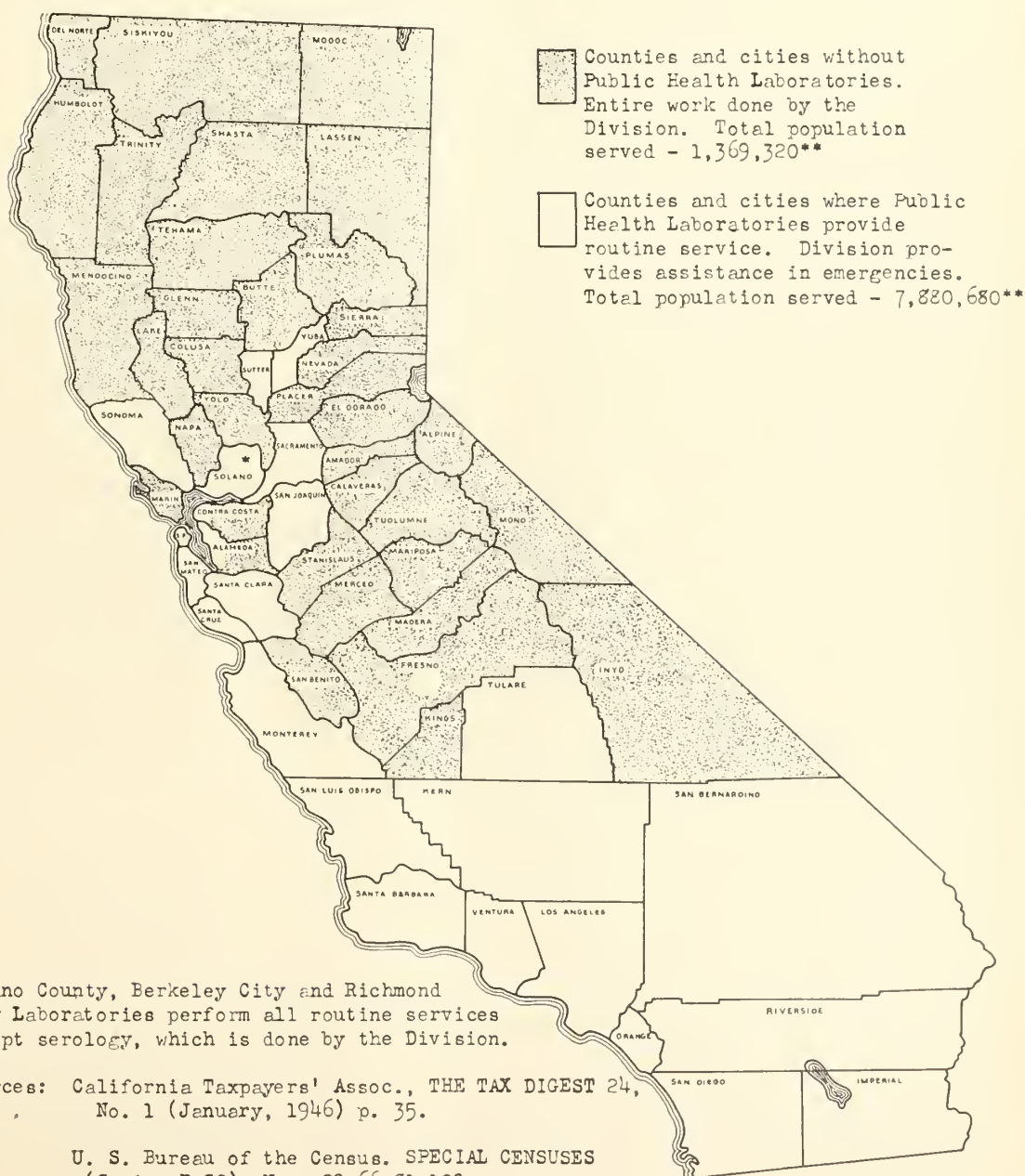
quate facilities and equipment and the use of approved test procedures, maintenance of adequate records, and employment of certified personnel.

Section 5 requires positive cultures from all typhoid carriers be sent to the State laboratory and that the State laboratory be notified of any specimens received for diagnosis of plague.

Section 6 requires that technical personnel be examined and certified by the State Department of Public Health and establishes minimum qualifications of candidates admitted to the certifying examinations.

FIGURE 1.

AREAS SERVICED BY THE STATE AND LOCAL PUBLIC HEALTH LABORATORIES IN 1945



Section 7 provides for apprenticeship training in approved public health laboratories.

Section 8 requires that certain specimens be sent to an official public health laboratory but provides that they may in addition be tested in other laboratories.

Section 9 provides for inspection of local laboratories by representatives of the State laboratory.

Section 10 permits local health departments to contract with approved private laboratories for service.

In addition to the enforcement of the Regulations, the State laboratory provides a consultative service to local laboratories. In fact, as already suggested, the enforcement of the regulations is through the avenues of a consultative and advisory service. This service is by direct visits, by telephonic or postal communications. Also, personnel are actually assigned from the State laboratory staff to work for varying periods of time in local laboratories to assist in emergencies and in the introduction of new techniques and procedures.

It should also be noted that the State laboratory produces and distributes most of the diagnostic antigens and antisera used in local public health laboratories. These include antigens used in serologic tests for syphilis, agglutinating antigens and antisera for enteric diseases, brucellosis, tularemia, etc. This helps to insure uniformity of tests throughout the public health laboratory system.

HOW SERVICE IS PROVIDED

Practically all specimens coming into the State laboratory come either by mail or other common carrier. The State laboratory provides various types of mailing containers to physicians throughout the area served. In many instances drug stores in the rural areas serve as repositories for these containers as an added service to the physicians of their community. In the majority of instances the containers are sent to physicians directly upon request. An account is maintained in the State laboratory for each physician or other repository receiving containers. We are currently carrying 1,175 such accounts. In other words, there are 1,175 repositories for State laboratory mailing containers scattered throughout the area represented by the shaded area of the map.

As with all diagnostic services provided by public health laboratories, no charges are made for these examinations. The only cost to the physician is the postage for mailing the specimen to the laboratory. Reports are routinely rendered by mail unless telephonic or telegraphic reports are requested, except in case of rabies, in which all positive reports are made by telephone or telegraph, and in other conditions deemed emergencies.

In the areas covered by local public health laboratory service there is some variation in the accessibility of the service to physicians. In all instances specimens are accepted if delivered to

the health department or laboratory. In some of the larger centers, as Los Angeles City, there are multiple repositories throughout the city where specimens may be left and from which daily collections are made. Through the system of district health offices the same general plan applies in Los Angeles County. In the latter department mailing containers are also provided so physicians may mail the specimens into the laboratory.

A mailing service is provided for blood specimens for serology by the San Francisco Health Department and by a number of other local health departments. In other words, health departments attempt to make the service readily available to physicians.

TESTS PERFORMED IN 1945

Since each local public health laboratory reports to the State at monthly intervals the tests made, it is possible to determine the types of tests performed and the total volume of work done in each public health laboratory in the State. This data for 1945, giving total number of each type of test done in all public health laboratories and the per cent of the total done in the State laboratory is shown in Table 1.

By this type of tabulation it is possible to illustrate objectively the inter-relationship as a working organization of the State and local laboratories. It should be recalled that the State laboratory provides direct service for approximately 15 per cent of the State population. If this figure is kept in mind as the respective test procedures are noted the test procedures in which the State laboratory provides overlapping consultative or special services in local laboratory jurisdictions will become evident.

In Table 1 several of the tests performed are listed by disease. It will be noted 6019 agglutination tests for brucellosis were performed, of which 26.3 per cent were done in the State laboratory. While the State laboratory provides the antigens used for these agglutination tests, most of the actual tests are performed in local laboratories. Four hundred twenty specimens were examined for coccidiomycosis with 25 per cent being done in the State laboratory. These tests include both cultures and animal inoculation, for the most part on sputum specimens. In the case of diphtheria, it will be noted that most of the Kellogg tests for determination of immunity were done by the State.

This, then, is one service that is provided almost exclusively by the State laboratory. Also few of the rural laboratories are equipped to do virulence tests accounting for the relative excess of this procedure by the State. The specimens are received in the local laboratory and forwarded to the State for testing, as it is the general policy not to accept such specimens directly from physicians in communities having local laboratory service. The same applies to amoebic dysentery and for botulism. On the other hand, in other types of food poisoning (e.g., salmonellosis, staphylococcal food poisoning), most of the outbreaks that are investigated occur in the larger

centers where local laboratory service is available so the State laboratory does a proportionately small percentage of the tests.

The larger venereal disease clinics have their own local laboratories that do the smears and cultures for gonorrhea at the clinic. The State laboratory provides no gonococcal culture service but does provide a consultative service on culture techniques.

Most of the meningococcal meningitis tests are performed at the local level. The State does a relatively high percentage of the paratyphoid agglutinations due to having established a Salmonella typing service. On the other hand, all the pneumococcal tests are done locally.

TABLE 1.—Total Reported Laboratory Tests Performed By Public Health Laboratories in California in 1945

Tests Performed	Number of Tests	% Done by State
Bacteriology:		
Brucellosis—Agglutinations	6019	26.3
Coccidioidomycosis—Cultures, Ani. Inoc.	420	25.0
Diphtheria—Kellogg Tests	2,202	89.9
Throat Cultures	56,310	7.7
Virulence Tests	505	38.4
Dysentery—Amoebic, Feces	1,213	33.4
Bacillary, Feces	1,789	1.4
Agglutinations	137	10.2
Food Poisoning—Botulism	123	46.7
Salmonella	114	13.2
Staphylococcal	581	3.3
Miscellaneous	489	3.1
Gonorrhea—Smears	86,058	6.2
Cultures	57,047	..
Leprosy Examinations	22	9.1
Malaria—Smears	204	20.6
Meningococcal Mening.—Spinal Flds.	422	.5
Nose and Throat Cultures	28	..
Parasites—Intestinal	1,664	5.4
Paratyphoid—Cultures	3,923	1.9
Agglutinations	6,489	48.0
Pneumococci—Blood Cultures	21	..
Sputum Typing	42	..
Rabies—Smears	3,716	7.8
Animal Inoculations	193	84.4
Staphylococci—Throat Cultures	1,705	.1
Streptococci—Throat Cultures	5,952	..
Spinal Fluid Cultures	1,502	..
Tuberculosis—Smears	23,236	17.5
Cultures	2,682	23.9
Animal Inoc.	1,479	53.2
Tularemia—Agglutinations	647	55.7
Typhoid—Feces and Urine	4,388	42.6
Blood Cultures	671	75.2
Agglutinations	3,201	48.3
Typhus and R.M.S.F.—Weil-Felix	575	27.8
Vincent's Angina—Slides	2,163	..
Miscellaneous (Pertussis, Fungus Examinations, Weil's Disease, Skin Tests, Anthrax, Trichinosis, Etc.)	1,052	48.7
Serology:		
Blood		
Kahn	258,461	17.8
Wassermann	201,841	24.1
Kline	516,685	46.3
Mazzini	25,318	..
Eagle	17,222	..
Spinal Fluids	17,093	33.3
Colloidal Gold	4,644	9.6
Clinical Tests	100,354	..
Tests on Milk and Milk Products	190,554	..
Water Samples:		
Bacteriological Examination	23,120	12.5
Chemical Examination	5,503	75.1
Miscellaneous Examinations	151	..
Miscellaneous Tests (Glassware, Rinse Samples, Etc.)	7,052	..

In rabies the majority of the smear examinations are made locally but animal inoculations are done at the State level as a consultative or special service to local health departments.

Practically all staphylococcal and streptococcal testing is done at the local level.

Continuing with Table 1, Public Health Lab-

oratories provide smear, culture and animal inoculation service for tuberculosis. The latter is again a special service the State laboratory provides for rural local laboratories. The same applies for tularemia.

The typhoid figures for 1945 are somewhat distorted by an outbreak in an area in which the State provides the direct service and by special studies the State was conducting in a mental institution.

Under the miscellaneous item are noted several other procedures offered by public health laboratories such as cough plate tests for pertussis, examinations for fungi, agglutination tests for Weil's disease, occasional examinations for anthrax, plague, trichinosis and other of the less common diseases. The tests noted in this table illustrate the wide variety of bacteriological test procedures on communicable diseases provided to physicians and health officers by public health laboratories.

Additional services routinely offered are also listed. The relatively large volume of serology in the State laboratory is due to the Selective Service and other testing in connection with the war which has been done at the State level. The State laboratory also does the serology testing for a number of State institutions.

It will be noted that all clinical tests are grouped together and that they are done exclusively in local laboratories. These are routine urine analyses, blood counts, sedimentation rates, etc., done in connection with the operation of local public health clinics. Such specimens are not accepted from private patients either at the State or local level.

Since at the State level the State Department of Agriculture is responsible for enforcement of laws pertaining to milk and milk products, the State Department of Public Health laboratory does not participate in this field. However, such testing is done in the public health laboratory at the local level.

The bacteriological testing of water samples is a routine procedure in all public health laboratories. However, only a limited number are equipped for chemical tests on water, accounting for the diversion of this work to the State Laboratory.

A number of miscellaneous examinations on water primarily of sanitary significance are also done in local laboratories.

The above listing provides a resume of the routine services provided by the State and local public health laboratories. In addition there are a number of services provided exclusively by the State laboratory that are of interest in rounding out the picture.

First might be mentioned the services of the Virus Laboratory. In 1939, through grants from the Rockefeller Foundation, the State Department of Public Health established a virus research laboratory for the study of influenza. Since then the scope of the research work has gradually expanded to include infectious jaundice, atypical pneumonia, diseases of the psittacosis

group and typhus fever. A second special grant from the Rockefeller Foundation in 1942 made possible the establishment of a virus diagnostic unit. A year ago the research and diagnostic services were amalgamated and became the virus laboratory. This laboratory is now equipped to provide the routine diagnostic services shown in Table 2. The table also indicates the type of test performed. For complement fixation, neutralization and agglutination tests noted whole blood.

As a service to our own Bureau of Sanitary Engineering and to local health departments, bacteriological and chemical examinations are also done on water and sewage samples received at the State laboratory.

The public is protected from mussel and clam poisoning by testing done in the State laboratory and the imposition of quarantine by the State Department of Public Health.

As already noted most public health and clinical

TABLE 2.—*Diagnostic Services Offered By the Virus Laboratory*

Disease	Comp. Fix.	Neut. Test	Animal Inoc.	Other
Equine Encephalomyelitis:				
Eastern	X	X	X	
Western	X	X	X	
St. Louis Encephalitis	X	X	X	
Lymphocytic Choriomeningitis	X	X		
Atypical Pneumonia		X	X	Cold Agglutination
Psittacosis Group	X		X	
Influenza	X			Chicken Cell Agglut.
Typhus Fever	X		X	
Lymphogranuloma Venereum	X		X	

allowed to clot, is required. It is imperative that two specimens be submitted, the first taken as early as possible in the disease, the second two to three weeks later. A rise in antibody titer is positive indication of infection with the virus used in the test. The material used for animal inoculation varies with the disease. In encephalitis it is brain tissue collected at autopsy. In atypical pneumonia and the psittacosis group it is sputum or nasal washings; in typhus fever, blood collected early in the course of the disease; in lymphogranuloma venereum, pus aspirated from the bubo. All specimens for animal inoculation must be sent in iced or frozen with dry ice.

Additional activities engaged in by the State laboratory are listed in Table 3. One group of workers is constantly engaged in testing for plague rodent organ and flea specimens which are collected throughout the State. This provides a constant check on the distribution of rodent plague in California.

The enteric disease section of the State laboratory does phage typing of *E. typhosa*. This service has already proved to be of significant importance in the epidemiological investigation of typhoid fever outbreaks. Also, a complete Salmonella typing service is maintained which is providing valuable data on the occurrence and distribution of the various pathogenic species of Salmonella.

The testing of foods and drugs provides an important link in the protection of the public against dangerous products and against fraud.

A serology consultative service is available to all physicians in the State. In diagnostic problem cases specimens may be sent to the State laboratory for checking where Kline, Kahn and quantitative Kolmer Wassermann tests are applied.

Periodically unknown blood samples are sent to all laboratories in the State that do serological tests for syphilis. Defects found are corrected, thereby going far to assure the physician dependable serology tests in whatever laboratory done.

cal laboratories in California use diagnostic antigens and antisera prepared in the State laboratory. This helps to assure a uniform level of sensitivity of test procedures. Typhoid vaccine and silver nitrate ampules are also prepared and distributed.

All technicians employed in public health laboratories are examined and certified by the State laboratory before they are allowed to work in public health laboratories. Through a system of examination and licensing of clinical labora-

TABLE 3.—*Miscellaneous Services and Activities of the State Laboratory*

1. Examination of rodents and ectoparasites for plague and tularemia
2. Phage typing—*E. typhosa*
3. Salmonella typing
4. Physical and chemical testing of foods and drugs
5. Checking serology as consultative service
6. Evaluation of serology done by local public health and clinical laboratories under premarital and prenatal acts
7. Bacteriological and chemical examination of sewage
8. Examination of shellfish for toxicity
9. Production and distribution of biologics—typhoid vaccine, diagnostic antigens and antisera; silver nitrate prophylactic
10. Examination and certification of public health laboratory technicians
11. Examination and licensing of clinical laboratory technologists and technicians
12. Inspection of public health and clinical laboratories
13. Inspection and licensing of manufacture and distribution of biologics, including testing of Brucella Vaccine distributed throughout the State
14. Training of public health laboratory technicians
15. Special research projects (virus diseases, rheumatic fever, enteric pathogens, evaluation of laboratory procedures, etc.)

tory technicians, another safeguard is established to insure qualified clinical laboratory work for the physician. Clinical laboratory technologists who are licensed to operate and direct clinical laboratories are given rigid examinations in a further effort to maintain high standards of work. All clinical laboratories are periodically inspected and efforts made to correct any deficiencies found.

Any biologic producing establishments not licensed by Federal agencies are licensed by the State laboratory. This includes blood and plasma banks. Such establishments are required to meet

minimum standards established by regulations of the State Board of Public Health.

A public health laboratory technician training program is also conducted by the State and a limited number of local laboratories. This is apprenticeship in type and is of six months' duration. A salary is paid during this training period. Since 1942 over 50 public health laboratory technicians have received this training. Since this training is centered in a limited number of centers, the uniformity of laboratory procedures is facilitated.

Finally the State laboratory staff is constantly engaged in investigative work designed to improve existing test procedures and to devise new tests that will assist in the diagnosis of communicable diseases. Projects are currently under

way in various virus diseases, enteric diseases, serology and comparative evaluation of culture and animal inoculation tests in tuberculosis. This is in addition to the fundamental research being conducted through the participation of the Rockefeller Foundation which was discussed above.

SUMMARY

From the foregoing review of the public health laboratory program in California it becomes evident that the services offered provide a valuable adjunct to the diagnostic armamentarium of the practicing physician. By full utilization of these services the physician can improve his own service to his patients and at the same time make a valuable contribution to the control of communicable diseases in his community.

Practical Application of Newer Methods in Control Of Rodent and Insect Pests*

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THE stimulus to research provided by the necessities of war has produced several new materials which have appreciable value in the control of rodent and insect pests. In rodent control we have two new effective poisons, known as "1080" and "Antu"; in insect control the virtues of "DDT" have been widely extolled, and the possibilities of "DDD" and "666" are still to be exploited.

Over-enthusiasm for these new materials should not cause us, however, to lose our perspective on the long range program for control of various pests of sanitary significance. These new materials are not substitutes for tried and tested methods of control. For example, no matter what new rodenticides may be developed, the most effective basis of urban rat control is still the "building out" of rodents, or rat-proofing, supplemented by the greatest possible reduction in food supply for the rodents. Anti-rodent campaigns which neglect these important basic procedures are purely temporary in their effects. As another example, any effective mosquito control campaign must be based on elimination, as far as practicable, of all breeding places for mosquitoes.

The new materials are valuable supplements to basic control methods, but not substitutes for them. They must be used intelligently, bearing in mind always the particular advantages and limitations of each material and the conditions of each particular situation.

"Antu" is the trade name for alpha naphthyl

thiourea, which when ingested by rats causes a profuse oedema of the lungs, so that the animal literally drowns in its own juices. It is highly fatal to the brown rat, *Rattus norvegicus*, but is less effective against the black rat and the Alexandrian or roof rat. It is readily taken by rats when mixed with the usual baits. In the quantities used it does not appear to be lethal to domestic animals or man, so it is a relatively safe poison to use. As the brown rat is the most important urban rodent, its lesser effectiveness against other species of rats is not a serious disadvantage except in special cases.

The material commercially known as "1080" is a sodium fluoroacetate. Practically all fluorine compounds are poisonous, but this material is violently and very rapidly fatal in small doses and must therefore be used with the utmost care. The rats drink it readily in about 0.75 per cent (1 ounce in 1 gallon) solution without baiting, and small quantities in special containers can be exposed in protected places in rat infested areas, with a high percentage of acceptance. It is preferably exposed at night, and all poison containers and dead rats picked up the next morning. Practical field work so far performed indicates a much greater kill with this material than with any other rat poison taken internally. Its limitations are its high toxicity for all warm blooded animals, man included, and the extreme care necessary in its use. For the protection of the public it will be necessary to limit its use to official agencies only, in the same manner as we now limit the use of thallium sulphate.

"1080" may also be applied to grain baits and used against rural rodents such as ground squirrels.

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The remarkable tales told about DDT, the abbreviation of the chemical dichloro-diphenyl-trichloroethane (the chemists have a longer and more exact name for it, namely 2,2-bis (p-chlorophenyl)-1,1,1-trichloroethane) have perhaps produced expectations that may be overly great. These tales have not pointed out that the material has certain limitations. Unquestionably it is a valuable insecticide when used under appropriate conditions and with proper techniques and safeguards. But it is not a universal panacea for all arthropods, and like practically all insecticides it is a poison which must be handled carefully.

Against fleas and bedbugs it is absolutely sovereign when properly applied to the *areas* infested (not to the animals or humans). A 2.5 per cent emulsion in water, prepared by dilution of a 25 per cent (by weight) solution of DDT in xylene with an appropriate emulsifier, sprayed on the areas occupied by animals, will within a few days rid them of fleas for a considerable period. The writer personally knows of one case where two dogs and two cats have been absolutely free from fleas for over seven months as the result of one thorough spraying of the premises.

It appears reasonable to assume that in the presence of plague, health authorities will use DDT extensively as a spray or dust to kill fleas on premises where either infected rodents or human cases are found, in order to minimize the possibility of transmission of infection by fleas.

Spraying mattresses and bedsteads with a 5 per cent emulsion is also completely effective against bedbugs (*Cimex lectularius*) for several months. A supplementary spraying along the baseboards of bedrooms is helpful.

A heavy spraying with a 5 per cent emulsion or kerosene solution of DDT is fairly effective against most cockroaches, though it may not be too effective against the German roach.

Applied either as a 2.5 per cent or 5 per cent emulsion or oil solution to surfaces upon which flies and mosquitoes alight or rest, it is highly effective in killing adult flies (*Musca domestica* principally) and adult mosquitoes of all species. The residual effect of the deposit of DDT on such surfaces normally persists for from several weeks to several months, depending apparently upon the amount of exposure to sunlight, rain, and moisture.

The ordinary household-type hand sprayers are not well adapted to the application of DDT sprays to produce residuals on surfaces. It is preferably applied by power sprayers using nozzles which have been calibrated to determine their rate of discharge at various pressures. It can be applied by sprayers of the Hudson cylinder type, or by knapsack sprayers. Nozzles should produce a rather fine spray, but should not atomize the liquid. Nozzles should be held about 18 inches of the surface being sprayed.

Where discoloration from oil stain is not objectionable, or where there is no fire hazard, a 2.5 per cent solution of DDT in Diesel oil or stove oil is satisfactory and relatively cheap. Where oil stain is objectionable, as within houses,

the DDT-xylene-emulsifier mixture in water is preferable. Still other methods of application, including a wettable powder, are being developed, and paints containing DDT are also being marketed. The wettable powders can be dispersed in water and sprayed with less danger of toxic effects upon workmen, as compared with the solutions or emulsions.

The amount of DDT applied for residual effect is normally about 100 mgm. per square foot of surface area. This quantity is obtained by applying one gallon of 2.5 per cent DDT spray to 1,000 square feet of surface. Spraying pressures of from 40 to 60 pounds per square inch are satisfactory.

Applied thoroughly to houses, DDT residual spray will reduce appreciably the incidence of a mosquito transmitted disease, even though conditions do not permit effective measures for the control of mosquito breeding. In general, however, DDT residual spray is a valuable supplement to measures for the control of mosquito *breeding* or fly *breeding*, but it is not a substitute for such measures.

Applied in emulsion form or solution form to water breeding mosquito larvae, DDT is lethal to the larvae in extremely low dilutions (1 to 50,000,000 or even lower) in the laboratory, but in the field its results are irregular. In some breeding places it is spectacularly effective and economical; in others it is a complete or comparative failure. A great deal more practical work needs to be done *in the field* before we really understand its uses and limitations as a mosquito larvicide.

For temporary control of extensive mosquito breeding areas, the application of DDT either in oil solution or as a dust by airplanes has been quite effective against *Anopheles* breeding.

You have undoubtedly all heard of the remarkable success of powdered DDT (10 per cent micronized DDT in finely powdered pyrophyllite, talc or other dust) in controlling body lice and thus controlling typhus. This method of louse control is so effective that it is anticipated that it will ultimately displace all other delousing methods.

Used in dust form as an external parasiticide, it does not appear that DDT is toxic to humans. In solution or emulsion form, DDT is toxic if absorbed by the skin in sufficient quantities, but not if reasonable precautions as to washing are taken. A large number of men have handled DDT in various forms, during its manufacture, preparation for use, and application, and as yet practically no cases of human poisoning have been reported. In some cases it is possible that a dermatitis may have been caused by the organic solvents used (xylene and acetone) rather than by the DDT.

Taken internally, DDT is toxic. At least one suicide by ingestion has been reported, and the writer has heard of one group of prisoners of war, who did not read English, who stole and used DDT internally, with several fatalities resulting.

Apparently DDT needs to be handled with the same care that is required in the use of other toxic materials used as insecticides. Its misuse or careless use may produce tragedies similar to those which have occurred with the arsenic, fluorine and thallium compounds.

Two other new insecticides are now being studied, but so far sufficient quantities have not been available for extensive practical tests. The laboratory results indicate that they may be valuable insecticides also. One is known as "666" or $C_6H_6Cl_6$. The gamma isomer of this chemical appears to be about as toxic to insects as DDT, but the other isomers are of low toxicity. The other material is "DDD," a close relative, chemically, to DDT, but having one less chlorine atom in the molecule. It appears to have properties similar to DDT, and may be easier to manufacture, and perhaps lower in cost.

In the long run, new methods and new materials for the control of rodent and insect pests seldom revolutionize control. The time-tested and experienced-trying methods and materials continue to be used, because they are effective. The new methods and materials, after a large initial ballyhoo, find their proper relative place in the scheme of operations. In the end they reinforce but seldom eliminate the old standbys. All methods and materials have their advantages and limitations according to conditions. Those which are new and effective extend our ability to control our environment in the interest of health and comfort.

DISCUSSION BY JOHN C. DEMENT, M.D.

It is a great pleasure to have been asked to discuss this very timely paper of Mr. Gray's. I do not feel competent to discuss its technical aspects, but would like to mention briefly some of the public health implications of the problem with which it deals—that of man's age-long battle against animals and insects which are vectors of disease. Zinsser has traced the influence that this battle has had on history and on civilization in his popular "Rats, Lice and History." We read of plague in China or North Africa and are inclined to think of this as an interesting but remote medical problem, forgetting that plague in California, like the poor, is always with us, endemic in its sylvatic form in many areas of the State, with every now and then a human case of two to remind us of its potential threat. Typhus is reported in Eastern Europe or Japan, far removed from us; but, here in California, we have discovered that we have our own typhus problem—murine typhus transmitted not by the louse but by the rodent borne flea. In the last ten years, 283 cases of murine typhus have been reported in California, with a five-year average for the period 1936-1940 of 19 cases a year; and for 1940-1945, 37.6 or twice as many. During 1944, cases of murine typhus in the United States increased 16.6 per cent over 1943, and this is believed by those studying the problem to be due to an actual increase as well as to better reporting of cases by state and local health departments.

The approach to this problem is not the same

as in the louse-borne epidemic typhus we encountered in Europe. There DDT dusting of humans combined with vaccination proved spectacularly successful in the control of epidemics in Italy and Germany. The establishment of border control centers along the northern border of France by the Ministry of Prisoners, Deportees and Refugees, effectively prevented the introduction of typhus in epidemic form into France, although over two million French nationals were returned to their own country in a relatively short time. VE-Day came before these reception centers were completed and the organization functioning smoothly. In spite of this, however, few cases of typhus escaped the preliminary screening at improvised reception centers in Germany and the more comprehensive screening at the border control stations. Theoretically, all of the returning prisoners and civilian deportees were screened and dusted with DDT in Germany. Remarkably few cases of louse infestation were found at the border reception centers and only a few cases of actual typhus ever reached these centers. Those that did were immediately removed to French military and civilian hospitals and strictly isolated, and all persons processed through these centers were again dusted with DDT. Sometimes this dusting routine broke down due to inability to keep the stocks of DDT powder where they were needed, but on the whole the system worked well. With the exception of a minor epidemic in and around Paris in which some 60 cases were reported and which was probably introduced by air-borne returnees flown directly from Germany, I know of no actual epidemic of typhus in France. We had large numbers of Polish, Russian and Italian displaced persons to take care of in poorly equipped camps with wholly inadequate housing and sanitary facilities, but the incidence of louse infestation was remarkably low due to the use of DDT, and no cases of typhus occurred as far as I know in any of these camps. On the other hand the German army, without DDT, apparently had a high incidence of louse infestation as judged by the condition of prisoners of war and the presence of lice in captured bunkers and barracks formerly occupied by them. The German concentration camps were notoriously lousy and typhus prevalent.

The control of murine typhus on the other hand is a question of the control of the rat and mouse population. With a mortality of something less than 5 per cent and still a relatively small number of human cases, extensive vaccination is not practicable. Control of the rodent population not only will control murine typhus but also leptospirosis and the possibility of rat borne plague. As Mr. Gray has so well pointed out, basic proven control measures, not only against rodents but against insect vectors, still form the backbone of our attack and these newer agents must be fitted into their proper place in the control program. No program as yet based solely on killing or trapping rodents has proved effective. Rat-

proofing of buildings and protection of food supplies against rats and mice still must be carried on. The control of mosquitoes and flies is the control of their breeding not the killing of the mature insects. These are measures which cannot be left to the individual citizen but which must

be carried on as an organized community effort. It is our responsibility as physicians to educate our own communities as to the need for these measures, and our responsibility as citizens to see that they are carried out.

Malpractice Litigation as It Concerns The Dermatologist*

CLEMENT E. COUNTER, M.D., *Long Beach*

THERE are two reasons this subject has been chosen for the chairman's address to this 23rd annual session of the section on dermatology and syphilology of the California Medical Association.

One of these reasons is a statement made by Dr. Louis J. Regan at a meeting of section officers of the California Medical Association in January, 1946. He said that if the present rate of malpractice litigation continues each of us will be sued every 11 years. This is a statement of the average and it actually means that some of us will be sued oftener and that a few will not be in court as often as once every 11 years.

The other reason is that your chairman and his associate in practice have just finished a year of irritation and distraction from practice that goes with a malpractice civil suit in preparation for court. There were the long tedious pretrial depositions requiring many visits to the plaintiff lawyers office. There was much apprehension of the unexpected. We could not see where there was merit in the complaint but in spite of reassurance by our attorney we feared that some unseen danger lurked. It seemed there must be some better reason for the complaint than was given, since the plaintiff was willing to risk so much expense in preparing his case when we seemed to have such a good defense. We did much searching of literature references. Finally, there was the 14 days in court during which our office was closed half time. The judge and jury were kind to us and the defendants were completely exonerated.

These reasons, I say, have suggested the subject of malpractice litigation.

Thirty-six dermatologists of Los Angeles County were questioned this year about their personal experience with malpractice claims. Thirty have never had a complaint of malpractice filed against them. Six had been named as defendants in five suits. Seven of the 30 who have never been brought to court have had eight threatened complaints. These never became suits but they are here included in this investigation to give us a

little more information on the sources from which one may expect danger on the matter of alleged malpractice. All malpractice suits and threatened malpractice complaints here considered have occurred in the past ten years.

The five malpractice claims were as follows:

1. A syphilitic patient having a darkfield positive genital ulcer and a negative blood Wassermann reaction was given treatment so that she never developed a positive Wassermann reaction. She later alleged that she had been wrongly diagnosed and wrongly treated for syphilis because she had never developed a positive blood test.

2. A patient who suffered 90 per cent loss of vision from syphilitic optic atrophy had begun losing eyesight during the administration of a long course of tryparsamide. The tryparsamide was used to treat the neurosyphilis which was responsible for the blindness. Twenty-three injections of pentavalent arsenical preparations were given before the patient complained of eye symptoms. Tryparsamide was being given at the time vision disturbances were first experienced. Sixteen weekly 3 gm. injections had been given when the patient first complained of hazy vision. Tryparsamide was immediately discontinued but the patient claimed that her blindness was due to her physician's carelessness.

3. A patient who was successfully treated for acne alleged that the residual acne scars had been produced by over treatment with x-rays.

4. In a successful case of roentgen ray treatment of an epithelioma on the cheek, the eyelids were not actually covered with lead. The x-rays were localized to the lesion by means of a cone. Later, cataracts developed and the patient charged that injury to the eyes by x-rays when they were not covered during treatment of the epithelioma was the cause of the cataracts.

5. A patient having a contact dermatitis was studied by means of patch tests. A positive reaction was obtained from one of the patches. Later a complaint was filed claiming that the entire dermatitis had been produced by the patch tests.

Of the eight threatened complaints which were not followed by actual litigation, four concerned alleged misuse and over-treatment with x-rays. One alleged carelessness in an attempted scar

* Chairman's address. Read before the Section on Dermatology and Syphilology, at the Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

removal. No guarantee of good results had been given. One patient who was unhappy because he developed increased dermatitis charged that his doctor had given him medicine that produced the bad result. After considerable effort it was shown that the medicine actually responsible for his dermatitis was a sample which he had applied from his own stock on his own responsibility. The last of this series was the case of a patient who had a mole removed and a keloid developed in the headed wound. The patient charged that careless and bunglesome surgery were responsible for the untoward result.

Two of these eight threatened complaints were made by patients to avoid the payment of legitimate fees. These were not unreasonable fees. In one instance the fee had been agreed on before the work was done. In the other the fee was five dollars which was charged for two office treatments.

Twenty-three of the 36 dermatologists interviewed had never been sued nor even threatened with suit. Fourteen of these fortunate physicians have been in practice more than ten years. Three have practiced dermatology more than 25 years. These doctors have our congratulations and sincere good wishes that their good fortune may continue.

It has been noted by Dr. Regan¹ through his close contact with litigation against physicians that malpractice complaints against general practitioners in the field of dermatology and syphilology predominantly include the claims that arsenical preparations of improper dosage or wrong character were administered. Several of these patients have had severe exfoliative dermatitis, and at last one has died. Other claims in this field against the general physician are the over-treatment with some type of light treatment, and the claim of injury due to local applications of a too concentrated character.

It is stated that almost all malpractice claims are instigated by physicians² and this probably is the chief cause of such litigation. There is no denying that the results are deplorable, but when the question is asked, "Why is it that physicians are so prone to criticize their colleagues?" it should be remembered that that reaction on the part of the physicians is only natural and perfectly human.

The criticizing of one by another is a natural human trait and is one not peculiar to physicians, nor can it be explained by the striking individualism of physicians. Who is less individualistic than the barber who dares not open or close his shop to suit his own convenience, but must follow the exact opening and closing time of all other barbers in his vicinity for fear of losing customers.

There is the example of the barber of a large city hotel who gave a guest a hair trim. Later the following day he was again engaged by this same guest to perform other tonsorial service. Upon finishing the service the barber informed the

guest that he really needed a hair trim. "That's peculiar," said the guest, "I just had a hair trim yesterday." At that the barber began to describe the many shortcomings of the barber, whoever he might be, who was responsible for such a haircut. The guest thought that if his hair was so very unsightly he should have it trimmed again and the barber was permitted again to trim his hair. While the second hair trim was in progress the barber insisted that if the poor workman could be found who had previously worked on him he should be made to correct his mistake and carelessness without charge. The guest waited until his hair was trimmed for the second time and then told the barber that it was he, and none other, who was that careless one. The barber lost a fee, but suffered no further damage.

There is a similar ring to the story told by Regan³ of the two physicians who practiced as partners on the outskirts of Los Angeles. They had an equipment to administer x-ray therapy, and employed a technician. A patient presented an eruption on one hand. One of the partners, Dr. A, prescribed a course of x-ray treatments. These were administered by the technician. Several weeks later the patient returned to the office. At this time Dr. A was absent from the city. The patient was sent in to Dr. B who was seeing her for the first time. Without giving the patient an opportunity even to state her name, Dr. B exclaimed: "Good heavens, woman, someone has certainly given you a terrible x-ray burn!" It is said that the punishment fitted the crime this time. Dr. B was equally liable with his partner for the negligence of their employee. Unlike the barber, in this instance there was further financial damage beyond the loss of ordinary professional fees.

Like those of the talkative criticizing barber, the remarks of Dr. B were unnecessary and actually untruthful. The statement of the barber (and of Dr. B) was intended to convince the one being served of his own personal accomplishments and great acumen in being able to locate imperfection quickly. If all careless fault-finders were to suffer similar experiences of self-appointed punishment regularly, the thing known as "the malpractice problem" would quickly end.

It is my observation that dermatologists among many others have learned the lesson intended to be taught by these statements. They have learned that they often see the patient subsequently and have the advantages that go with being in that favorable position of being the last one to see the patient. They also have learned that they may raise themselves by praising the acts of their colleagues. One who has learned well this lesson says to his patient that the other physician is a gentleman or lady, well-trained, careful and capable. What he does not need to say, because it is so eloquently implied, is that he himself is also a fine gentleman because he can recognize those virtues in his fellow physician.

It is the practical application of the principle taught by the Great Physician Himself when He

said, "Everyone that exalteth himself shall be abased, and he that humbleth himself shall be exalted." (Luke 18:14.)

It is obedience to the laws which should govern all human relations. These laws were so grandly summarized by Jesus Christ when He answered his learned questioner on which is *the great commandment*—which is the great law. He said, "Thou shalt love the Lord thy God with all thy heart, and with all thy soul, and with all thy mind. This is the first and great commandment. And the second is like unto it, Thou shalt love thy neighbor as thyself." (Matthew 22:37-39.)

What physician is there who, thinking as much of his neighbor physician as he does of himself, could depreciate his colleague in front of his patient? No, no physician could. Practical Christianity offers a complete solution to the malpractice problem.

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THE MEASURE OF A MAN

What is it to cease breathing, but to free the breath from its restless tides, that it may rise and expand and seek God uncumbered?—Kahlil Gibran.

The measure of a man is the man himself. Regardless of race or religion he stands alone to receive the judgment of his peers. Judgments of character based on color or on nationality, race or creed, have a foundation as unfirm as quicksand. Every race, every nation, has brought forth saints and sinners, savants and imbeciles, philanthropists and tyrants. Good and evil are curiously blended in us all and the virtues of each must be weighed with his faults. Black or white, Jew, Gentile or Pagan, each is a human being. Be his skin dark or fair, he may be noble or ignoble, learned or untaught, generous or selfish, kind or cruel. Whatever his qualities, he has them, not as the representative of a group, but as a solitary individual who can answer to God and man for his own conduct alone.

Man, a gregarious animal, possesses a strong herd instinct which has been necessary to his security. Individuals who deviate in any noticeable degree from the herd pattern suffer disapproval and discipline to a greater or less degree. Whether the deviation be physical due to race, or mental because of religious or political differences, the majority will either seek to force or absorb the minority into the prevailing pattern, or wreak vengeance upon it. Only a civilization which gives a high sense of social consciousness and responsibility can destroy or modify this tendency, which becomes greater in proportion as minority groups encroach upon the security

and privileges of the majority. Both majority and minority groups in this nation share an awesome responsibility one to another.

The profession of medicine is altruistic and international in its ideals and endeavors. Its universal purpose is the alleviation of human suffering and the betterment of the physical and mental status of humanity in all lands. Physicians, better than others, know that the human mind and body is shaped of the same materials and destroyed by the same diseases whether the skin be white, brown or black. Physicians, then, should lead other men to an equally clear conception of the great truth of human brotherhood. Until this haggard world accepts the belief that all nations can dwell together in friendship and harmony, war and bloodshed will be our common lot.

Our own county medical association, soon to have a membership of more than four thousand highly trained physicians, has never inquired of an applicant for membership concerning his race or religion. If his training and character are sound, it matters not whether he be emigre or Mayflower descendant. Men and women of many races and creeds are and have been active partners in its work. Let us not speak of tolerance, lest it imply the existence of intolerance. Let us continue, in the future as in the past, to set an example of harmonious work and accomplishment, and disregarding nativity and creed, bestow honor and affection upon those who best serve science and the welfare of mankind.—E.T.R., in the *Bulletin* of the Los Angeles County Medical Association.



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EDITORIALS

PURIFIED GLYCOSIDES OF DIGITALIS

The recent progress in the synthesis and clinical use of the purified glycosides of digitalis purpurea and lanata has been an important contribution to cardiac therapy. The importance of fundamental chemical research in providing data that can subsequently be used to advantage in clinical medicine has again been amply confirmed. However, just as in the case of the endocrine products, a plethora of names is appearing to plague the practitioner who would use the newer preparations.

In the past, digitalis folia, USP, was the only commonly used digitalis product, although on occasion digifoline, digifortis, thevetin, urginin, etc., were used. Ouabain was the only commonly used preparation for rapid digitalis effect. In recent studies, the purer preparations of digoxin, cedilanid and digitoxin have been shown to be effective and can be used both orally and intravenously. Digoxin and cedilanid are derived from digitalis lanata. Following the excellent work of Gold, et al., who emphasized the importance of digitoxin, three commercial products of this glycoside are available—digitaline nativele, purdigin and crystodigin. It is not clear how these three preparations differ in composition, if they significantly do differ. To digitalize and maintain a patient with cardiac failure one has at present the choice of at least eight preparations derived from digitalis bodies, with different names and dosages, but with similar pharmacologic effects.

Oral digitalis folia, USP, has proved itself over many years to be an effective therapeutic agent in cases requiring only average speed of digitalization. It has not been entirely satisfactory for a number of reasons. It must be biologically assayed, each preparation often differs in potency, and only 10-20 per cent of a given oral dose is absorbed. Gold, et al., showed that in a number of oral preparations of digitalis from various pharmaceutical firms, the potency varied 300 per cent between the weakest and the strongest, yet all were labeled USP. It is clear that these preparations

would not be interchangeable. The changing values of the USP unit of digitalis with each revision of the U.S. Pharmacopeia has been confusing. The digitalis of USP XI was 30-50 per cent stronger than that of USP X. Scarcely had this been emphasized in articles and editorials, warning against overdosages with USP XI digitalis, when USP XII was released, in which digitalis strength was reduced to a point halfway between USP X and USP XI. We must now be on the alert for digitalis underdosage. Despite these shortcomings, digitalis folia is an excellent and effective preparation for oral use in the average case. The variability in the dosage requirement of the patient makes it necessary to observe the patient closely for the earliest toxic symptoms, regardless of the strength of the digitalis preparation used.

When the clinical situation is urgent and therapy must necessarily be rapid, the use of the purified glycosides has been of greatest aid. In severe cardiac failure, pulmonary edema, auricular fibrillation or flutter with rapid ventricular rates and cardiac failure, the intravenous use of the purified glycosides (ouabain, cedilanid, digoxin, digitoxin) has been both dramatically effective and without significant toxic sequelae.

The recommendation of the Cornell group of investigators that digitoxin be used in single-dose digitalization as a routine procedure has evoked considerable interest. It has not, however, been universally accepted, largely because the incidence of vomiting, while less with digitalization with digitoxin in a single dose than with ordinary digitalis in a single dose, is still greater than with slow digitalization. It may be that a compromise will be reached and the pure glycosides given in divided dosage over a 24-hour period, rather than in a single dose. Certainly care must be used in rapid one-dose digitalization in older people and in patients who have developed cardiac failure following an acute myocardial infarction. Oral use of the purified glycosides would not ap-

pear to have any significant advantage over oral digitalis folia for the purpose of maintaining digitalis effect, except in rare cases. In a recent study, Sokolow and Chamberlain found that cedilanid and digitalis folia were interchangeable at maintenance doses of 1.5 mg. and 0.15 gm., respectively. The maintenance dose of digitoxin was found by Gold and his group to be in the range of 0.1 and 0.2 mg. Care must be used to prescribe digitalis preparations by weight rather than by cat units when they are to be used orally. The cat unit is based on intravenous use of the drug and the factor of absorption is most important in oral medication. When the purer glycosides are used intravenously in man, roughly three to five cat units of each will digitalize.

A safe procedure for the practitioner who will

want to take advantage of these newer glycosides will be to learn the use of one or two preparations well. Any of the purified glycoside group will be adequate for rapid oral or intravenous digitalization, the variabilities being dosage, speed of action and excretion; the pharmacologic effects do not differ. Once one has gained experience with a representative of the group, one will have at hand an exceedingly useful drug for cardiac emergencies. When the situation does not require rapid digitalization, the use of ordinary digitalis folia over a period of two to four days will prove adequate in most cases. The choice of digitalis preparation in cardiac therapy will depend on the speed with which digitalization is required and the familiarity that the physician has with the use of any given preparation.

The A.M.A. and the Future

Successful completion of the A.M.A. 1946 annual session in San Francisco brought forth some highly complimentary remarks from the eighty-five hundred physicians attending from all parts of the country. While not all those at the meeting were able to get the hotel accommodations they wished, there was praise everywhere for the manner in which the scientific, technical and business meetings were arranged, for the handling of hotel space and the general arrangements for all the myriad details entering into a larger meeting. The local committee on arrangements, representing a large number of practising members of the San Francisco County Medical Society, did its job in splendid fashion and deserves all the credit given it.

On the scientific side, the meeting presented the usual high quality exhibits and scientific meetings. On the technical side, the exhibits were numerous, interesting and splendidly laid out for the convenience of the visiting physicians. The weather was ideal and, aside from the street car strike prevailing during part of the meeting, everything for the comfort of the members was in good shape.

On the business end, however, there seems to be much to be desired. The House of Delegates, meeting on three days of the session, covered an unusually large amount of ground and, judging by remarks dropped here and there by many members, probably moved so fast that some important pieces of business were left out of consideration or were hurriedly passed over.

One such piece of business—and this one came in for criticism by members of the House of Delegates from numerous states—was the report of the public relations survey of the A.M.A. made by Raymond Rich and Associates. This report, ordered by the A.M.A. Board of Trustees earlier this year, had been anxiously awaited by physicians throughout the country. When time

came for its presentation, the House of Delegates was given a concise interpretation of it by the Board of Trustees. Actual copies of the report were not available to the members of the House of Delegates despite requests for such copies and one rather pointed question from the floor as to how intelligent questions about the report might be asked by members of the House if they did not have access to the report itself.

It is recognized, of course, that any survey of public relations and public opinion, if it is worth its cost, must bring out the poor points of an organization as well as the strong. But it is acknowledged too that the medical profession will not be well served by any washing of dirty linen in public. Probability is that the Board of Trustees had not had time or opportunity to make a really thorough study of this report before the San Francisco meeting. Nevertheless, it is somewhat surprising for the legislative body of the A.M.A. to be denied access to a well conceived study of a subject which goes to the very roots of present-day American medicine and its organizations.

If the members of the A.M.A. House of Delegates cannot be trusted with information of a confidential nature, they should not be permitted to sit in that House. There is precedent for such action. If the members of the legislative body of American medicine are not allowed to legislate, there seems a question as to the need of establishing or operating a legislative session within the structure of the A.M.A.

The future of American medicine may well be at stake in the findings of the Rich report. The social and economic side of American medicine, as well as the scientific side, may well be seriously affected by the decisions of the A.M.A. on this report. In such circumstances it appears that full consideration should be given this report by the full membership of the House of Delegates. If there are weak points in the armamentarium of American medicine, let them be brought to light

by an unbiased surveyor, analyzed and corrected. If there are strong points, let them be made the basis for capital gains.

It is sincerely to be hoped that the December

meeting of the A.M.A. House of Delegates will bring to the membership of the House a full copy of the Rich report and full opportunity to discuss this report, its analyses and recommendations.

The Laboratory in Medicine and Public Health

The public health laboratory and the diagnostic clinical laboratory both serve important but distinct functions in the prevention and management of disease.

The organization and scope of the public health laboratories of California have been considered in this issue of CALIFORNIA MEDICINE. The organization is properly decentralized. Thus the State laboratory does not usurp the duties of the city or county organization but aids them in their development and in the maintenance of high standards. It provides the essential services where they cannot be provided locally. The laboratory services performed by the system of county and state public health laboratories are concerned properly with matters of public health importance, such as adequate control of the purity of water and food, in control of epidemic disease and other factors involving environmental sanitation. Thus, studies conducted by the public health laboratories revealed a dangerous degree of sewage pollution to exist on some of the popular ocean beaches. This led inevitably to quarantine of the beaches pending application of the corrective measures of sanitary engineering. Joint studies supported by public health laboratories, industry and Hooper Foundation of the University of California have done much to develop and maintain the high standards of canning in our state. The recently developed Virus Research Laboratory supported in part by the Rockefeller Foundation and under the jurisdiction of the State Health Department contributes importantly in safe-guarding public health. As a policy it would seem desirable to have such research activities closely linked to Medical schools and schools of Public Health.

The public health laboratories have a wide field

of important activities and need not, indeed should not, encroach upon the field of the hospital or diagnostic laboratories. The diagnostic laboratory is an important element in the organization contributing to adequate care of the patient. Its services should be readily available to the physician and it should be under the direction of a well trained pathologist. The pathologist must see that a high standard of laboratory service is available and should act as a consultant with the physician. There has, in fact, been a shortage of trained pathologists, but it appears that this is being overcome and an increasing number of able young men are choosing pathology as a specialty. The direct consideration of diagnostic problems by the pathologist and the attending physician has a great advantage over the impersonal and often delayed report coming out of a remote laboratory. Development of high-grade laboratory services in conjunction with adequate hospital facilities throughout the state constitutes one of our more important health needs. The young physician needs an adequate work shop. He is not content with "guesswork" medicine. Our needs should be clarified by the hospital survey currently being conducted by the State Health Department. When the needs are defined, a concerted effort should be made to meet them.

The research laboratories that ultimately contribute to medicine represent nearly all branches of science. More direct in their contribution are the investigations emanating from the laboratories of the basic medical sciences. New techniques of importance will continue to filter down from "pure" science to medical science and into the laboratories where they are applied in the prevention and care of disease. The role of the laboratory in medicine and public health will inevitably be one of increasing importance.

Cash Sickness Indemnities

When the California Legislature passed the cash sickness indemnity law at the 1946 special session it launched the State on a social security voyage which must be undertaken with a green crew and with only one chart. The crew is now being assembled and trained, the chart being surveyed.

The law is of particular interest to physicians because under its terms they are required to certify the unemployability of the applicant for benefits and to estimate the period of time his disability will continue.

Rhode Island is the state which has supplied

the chart for California. There a cash sickness indemnity law has been in effect since 1942, with benefits paid since 1943. Rhode Island's was the experience on which the proponents of the California law based their claims and relied for their figures and conclusions.

Now comes a review of the Rhode Island situation by the *Research Council for Economic Security*, a Chicago research organization catering principally to insurance underwriters. The review points to an increment in the reserve fund in 1943, the first year of benefit payments. In that year the fund took in \$4,700,000 in taxes and

disbursed \$2,900,000 in benefits. The increment of \$1,800,000 on top of 1942 collections of \$1,600,000 and no benefits, brought the reserve fund up to \$3,400,000.

At that point the gain in reserves ended. In 1944 the fund paid out \$600,000 more than its receipts and in 1945 the drain was another \$400,000. This left the reserve fund at \$2,400,000 at the end of 1945. For 1946 this review estimates collections at \$3,500,000 and disbursements at \$4,800,000. If this estimate comes true, the reserve fund at the close of this year would be down to \$1,100,000, or half a million dollars less than the original cushion collected in 1942 before payment of benefits began.

From this review the *Research Council* concludes that the tax rate of 1 per cent on Rhode Island wages has consistently been too low. It recommends that a rate of 1.5 per cent should be charged. Further, it points to the snowball tendency of social security programs as evidenced in

Germany, Great Britain, New Zealand and other countries.

While some of the lessons taught by Rhode Island were given consideration by California's legislators in passing this bill in this State, it is also remembered that many of the Rhode Island experiences were either brushed aside or lightly acknowledged and passed over. The tax rate of 1 per cent was followed to the letter, but some of the benefit provisions in the smaller state were toned down in the California measure to preserve the reserve fund. Whether or not the California provisions will produce the desired result, time alone will tell.

California is now launched on its voyage. The ship is ready, the captain and crew standing by until funds for benefit payments become available. It is sincerely to be hoped that the initial four years' experience in Rhode Island will not be duplicated here and shoal water approached by so large a vessel as the California ship promises to be.

ARMY GROUP CLAIMS SUPERIORITY OF SN 7618 AS ANTIMALARIAL

The superiority of chloroquine, also known as SN 7618, over atabrine and quinine in the treatment of vivax malaria is claimed in an article appearing in the June 20 issue of *The Journal of the American Medical Association*.

The authors of this report—Major Harry Most, Capt. Irving M. London, Capt. Charles A. Kane, Capt. Paul H. Lavietes, Capt. Edmund F. Schroeder and Col. Joseph M. Hayman, Jr., Medical Corps, Army of the United States—conducted the study at the Tropical Disease Section of the Moore General Hospital, Swannanoa, N. C.

The form of malaria caused by the *Plasmodium vivax* produces an attack every 48 hours. The authors state: "The effectiveness of chloroquine in controlling fever during the treatment of the acute attack of vivax malaria is striking. In a total of 244 patients treated with the drug according to plans A, B and C [one day, four day and seven day treatment schedules], only five patients, or 2.1 per cent, had fever (temperature of 100 F. or more) the day after treatment was begun or subsequently. In contrast to these observations, treatment with quinine in 184 attacks and with quinacrine [atabrine] in 391 attacks was associated with fever on the second or on a later day in 8.7 and 8.0 per cent respectively of the patients treated. Thus, chloroquine is more effective than quinine or quinacrine in promptly controlling fever during treatment of acute attacks of vivax malaria. This superiority is manifest in infections both of Mediterranean and of Pacific origin. . . ."

Moreover, the authors continue, "chloroquine is at least as good as quinine or quinacrine in the control of all symptoms and is superior to one or the other in the control of some symptoms.

"Headache and backache are relieved more rapidly with chloroquine or quinine than with quinacrine. Quinine is more effective than quinacrine in the control of generalized aching but is not significantly better than chloroquine. Weakness, dizziness and light-headedness disappear more readily with chloroquine or quinacrine than with quinine. Nausea persists longer in patients treated with quinine than in those treated with the other two. The effect of each of these drugs on the duration of vomiting, abdominal pain and abdominal tenderness is essentially the same."

Although none of these drugs produce a complete cure of malaria, the investigators are confident that from the data presented it is evident that chloroquine is superior to both quinine and quinacrine hydrochloride because "the interval before relapse after treatment with chloroquine will be on the average at least five weeks longer than after quinine and about two weeks longer than that after quinacrine hydrochloride. Only a negligible number of patients treated with chloroquine will have relapses during the first 50 days after treatment. Thus not only does chloroquine promptly control symptoms, fever and parasitemia [parasites in the blood], but, in addition, treatment with that drug results in freedom from another attack for a period of approximately two months."



Clinical-Pathological Conference

PRESENTATION OF CASE*

M. S., female, age 12. This child was first admitted to the University of California Hospital in November, 1936, with the symptoms of repeated episodes of vomiting, diarrhea, polydipsia and polyuria. She manifested a marked polyhagia with failure to gain weight and sugar was present in the urine. She had been treated by her local physician earlier in the year with a low carbohydrate, fat-free diet without insulin. Though the symptoms regressed somewhat, the gain in health was only temporary and for four months preceding the hospital entry she had shown easy fatigability and lassitude. After one week of insulin therapy the urines became sugar free. She was discharged from the hospital on 7 units of regular insulin three times a day (diet not recorded).

In the interval between 1937 and 1941 the patient entered the hospital several times. These entries are summarized briefly below.

November 10 to 18, 1937: Symptoms were initiated by nausea and vomiting followed by polyuria, polydipsia, disorientation, mild delirium, and Kussmaul breathing. Blood sugar was 465 mg. per cent, and CO₂ combining power 11.8 volumes per cent. Urine: acetone 4 plus; sugar, red reduction. Intravenous and subcutaneous fluids and insulin resulted in rapid recovery.

November 29 to 30, 1937: Symptoms of nervousness, restlessness, and, finally shock followed shortly an overdosage of insulin. The blood sugar was 44 mg. per cent. Intravenous glucose resulted in immediate recovery. Insulin dosage and diet were stabilized as follows: Diet: C 90, P 55, F 130, with 6 units (PZI) and 6 units (RI) a.c. breakfast and a.c. dinner.

February 8 to 11, 1939: Symptoms of apprehension, vomiting and chest pains accompanied by a blood sugar of 370 mg. per cent, CO₂ combining power of 12 volumes per cent. Urine: acetone 4 plus; sugar, red reduction. Parenteral fluids and insulin produced rapid recovery.

May 11 to 13, 1939: An episode of vomiting followed a mild upper respiratory infection. Blood sugar was 412 mg. per cent, CO₂ combining power 26 volumes per cent. Urine: acetone 3 plus; sugar, red reduction. Parenteral fluids and insulin produced improvement.

March 7 to 17, 1940: An infected hematoma developed after a blow on the mesial aspect of the left knee. Recovery followed surgical drainage and systemic administration of sulfonamides. Diet: C 100, P 65, F 100. Insulin dosage: 17 U (RI) and 17 U (PZI) a.c. breakfast and 11 U (RI) and 11 U (PZI) a.c. dinner.

August 21 to 22, 1941: A generalized abdominal pain of 3 days which had subsided when the patient reached the hospital was diagnosed as pos-

sible subsiding appendicitis. No treatment was given.

Eighth Entry: September 27 to November 29, 1943.

Present Illness: Prior to going to a Diabetic Summer Camp in July, 1943, the patient had been in good health and her diabetes well controlled. She was on a diet of carbohydrate 125, protein 80 and fat 85 and taking an insulin dosage of 34 units before breakfast (17 units of regular insulin and 17 units of protamine zinc insulin mixed), and 20 units before dinner (10 units of regular and 10 units of protamine zinc insulin mixed). On this regime she presented no subjective complaints save for a rare episode of apprehension, sweating and restlessness. (These were quickly alleviated by orange juice or candy). About August 3, 1943, she noticed a gradual onset of more frequent and severe episodes of this type until within a week after this they were occurring daily. During this period her insulin had been gradually reduced to zero without the appearance of sugar in the urine, or alleviation of the symptoms. Her diet was then increased to carbohydrate 175, protein 125 and fat 150. She was considerably improved, but was still frequently awakened about 2 to 5 a.m. with apprehension, restlessness and sweating. Since the onset of these symptoms, she has had a number of convulsions, one of which required 40 cubes of sugar for relief. She had received no insulin since August 10, 1943. The patient was admitted to the hospital for further study on September 27, 1943.

Physical Examination: Temperature 37° C.; pulse 86; respiration 18; blood pressure 115/85. General examination showed a well developed and well nourished girl appearing the stated age of 19 years and in no acute distress. The skin was clear and without blemishes. The right pupil was somewhat larger than the left and the right eye slit wider than the left. The pupils were round and regular and reacted to light and accommodation. Extra ocular movements were normal. The fundi presented no lesions. There were numerous small fillings in the teeth, but in general, the teeth were in good condition. The tonsils were moderately enlarged. The chest examination was normal to palpation, percussion and auscultation. The area of cardiac dullness was not enlarged. PMI at the 5th interspace within the midclavicular line. Rate and rhythm regular. No murmurs or abnormal sounds. The abdomen was flat and no masses or organs were palpable. The genitalia and back were normal. Reflexes were equal and average intensity.

Laboratory Examination: Hemoglobin 90 per cent; red blood cells 4.8 million; white blood cells 10,000. Polymorphonuclear neutrophils 65 per cent; lymphocytes 30 per cent; monocytes 5 per cent. The urine specific gravity was 1.020; pH 6.0; sugar 0; albumin 0; acetone 0; sediment—rare red blood cells and white blood cell, numer-

* Taken from the Clinical-Pathological Conference, Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

ous epithelial cells. Fasting blood sugar determinations varied from 36 mg. per cent to 47 mg. per cent. A Glucose Tolerance Test on September 23, 1943, was as follows: Fasting 47 mg. per cent; $\frac{1}{2}$ hour—78 mg. per cent; 1 hour—96 mg. per cent; 2 hours—91 mg. per cent. (Test terminated at 2 hours.) Plasma chlorides 533 mg. per cent as sodium chloride. Plasma cholesterol 176 mg. per cent. K. and K. negative. I. V. hippuric acid: 1.4 gm. excreted in the urine in one hour. P.S.P. 62 per cent excreted in 2 hours. A flat film of the abdomen showed no lesions. A skull film showed no evidence of enlargement or erosion of the sella turcica.

Course: During the course of the hospital studies, the patient experienced several severe episodes of apprehension, restlessness and sweating. In one such episode, the patient was unable to be aroused. The blood sugar at this time was 36 mg. per cent. These reactions were successfully treated with intravenous glucose. On October 6, 1943, an exploratory laparotomy was performed.

J. R.

DISCUSSION BY CLINICIAN

DR. ALLAN T. KENYON*: We have in effect a well established diabetes mellitus which has existed for some years and which has eventually disappeared and been transformed into a hypoglycemia state. This unusual course is beyond my experience and must accordingly be approached in a somewhat theoretical manner. The literature does indeed record examples of this sort, but I am unaware of the actual pathological findings in these circumstances.

Diabetes mellitus as we see it is a resultant of pancreatic deficit on the one hand and those adrenal and pituitary factors opposing the action of insulin on the other. It is not always easy precisely to state which force or deficit determines the disorder in given instances. As you know, gross destruction of the islets in ordinary diabetes is rare. Detailed cytological study may show deficiencies in beta cell granulation or little or nothing of even this. It is interesting in view of these relatively minor morphological defects that recovery of effective islet cell function is as rare as it seems to be.

Intervening destructive disease of either the adrenal or pituitary body would be expected to modify existing diabetes. No good evidence of gross adrenal or pituitary disease is provided by the record. Pigmentation, blood pressure, body hair and menstruation were unaltered. Existence of some peculiar and isolated adrenal or pituitary defect influencing carbohydrate metabolism alone may be speculated about. In Addison's disease, however, and in a recent University of California patient with Simmond's disease (quoting Dr. Kinsell), when diabetes mellitus coexists, insulin sensitivity is great, but glycosuria and hyperglycemia persist. That all evidences of diabetes

ceased in this girl makes it unlikely that intercurrent adrenal or pituitary deficiency was responsible for the alteration in carbohydrate metabolism observed.

Liver disease may modify the expression of diabetes mellitus. Such may be considered first in terms of liver defect due to pancreatic defect and secondly independent of it. Fatty livers in experimental depancreatized animals may arise early and be corrected by insulin or late and require accessory lipotropic substances for correction. In the latter instance glycosuria is ameliorated during the progression of the fatty change and intensified by such a lipotropic agent as lipocaic. The amelioration does not, however, proceed to substitution by hypoglycemia. Fatty changes of the initial type, relieved by insulin, are the most common in man and would not be expected to occur in this well treated girl, nor indeed would hypoglycemia be expected if they did occur, judging from experience with animals.

Intercurrent liver disease of a grossly destructive sort is not indicated from the clinical record. Conn has spoken of hypoglycemia as a more or less isolated expression of liver disease. In Conn's experience with such an individual a glucose tolerance test done after a careful preparatory diet showed a low fasting blood sugar but hyperglycemia thereafter. This differs from the California data. It may be judged that liver disease is unlikely in our child but is not excluded beyond all shadow of doubt. We shall accordingly pass on to the probability that some change in the islets themselves is responsible for the emergence or hypoglycemia from diabetes.

When a diagnosis of hypoglycemia is established and that hypoglycemia is shown to occur in the fasting state, islet cell tumors are found in the great majority of cases. One may raise the question as to whether there is any good reason here for departing from this indication from percentage in favor of some rarer process such as hyperplasia of the islets. I am inclined to favor hyperplasia here for a somewhat theoretical reason. The islet defect in diabetes when it exists is diffuse and I should expect the recovery to be. It is so, you recall, in dogs made diabetic by pituitary extracts (Young's diabetes) when the experiment is not carried to the point of permanent injury. Such a consideration should not of course lead to any deterrence of the surgeon and the most painstaking search for a tumor must be prosecuted. Such tumors may be tucked up well behind the head of the pancreas and be difficult to find.

There does exist one very curious analogy with the process of hyperplasia that may have occurred here. These are a few instances of full blown exophthalmic goiter arising during the course of thyroid treatment and continuing after thyroid has been stopped. In these instances the usual suppressive action of a hormone on the gland of origin has been lost and some obscure compensating process has forced its way through this commonly effective physiological barrier. Some such process may have occurred here and I should con-

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sider it the likely answer although an islet cell tumor must be sought for and responsible liver defect is not impossible.

PATHOLOGIST'S DISCUSSION

DR. J. F. RINEHART*: This case is unique in my experience. I have seen nothing exactly corresponding to it, and I am not aware of a comparable case in the literature. The exploratory operation was quite thorough, including a careful search of the pancreas and entire gastrointestinal tract for an adenoma. If not found in the pancreas such tumors are found somewhere along the small intestine, or near the distal end of the pancreas adjacent to the spleen. In this case no such tumor was found. After some hesitancy on the part of the surgeon and internists concerned, a subtotal pancreatectomy was performed. There was a somewhat stormy postoperative course complicated by a partial intestinal obstruction, which was surgically relieved. Following this a pneumonia developed which was moderately severe, but the child recovered. The subsequent course indicates that the condition causing the hypoglycemia was relieved by the pancreatectomy because the child has again become diabetic to a degree somewhat less severe than originally.

I would like to show you a few slides prepared from this pancreas. First I would like to say that careful study of the pancreatic tissue removed did not reveal an adenoma or any abnormality that was grossly recognizable. The tissue was cut at intervals every two or three mm. and I feel

confident we have surveyed the pancreas very carefully.

Here [slide] is a section from this pancreas showing a small "normal" pancreatic islet. The islet illustrated here is really somewhat atrophied, the cells are rather small and they appear functionally relatively dormant. In this second slide [slide] we have something quite different. In the first place this structure illustrated is large, relatively to a normal islet. This is an abnormal "islet" and is representative of many such structures present in this pancreas. The cells and their arrangement have an appearance which is intermediate in character between islet and acinar tissue, and it appears to me that these abnormal islets have in fact arisen from the exocrine or acinar tissue rather than representing an hypertrophy of pre-existing islets. I assume that these abnormal islets were the functional tissue causing the hypoglycemia. This is, in fact, an assumption. However, the failure to find an adenoma and the fact that the pancreatectomy relieved the condition supports this conclusion. The child is now well except for a mild diabetes.

Now I would like to show slides to illustrate the more common findings. The adenoma illustrated here [slide] is the more usual finding in cases showing the clinical syndrome characterized by attacks of hypoglycemia. Islet adenomas are usually purplish-red nodules of tissue rarely over a centimeter or two in diameter and of the characteristic histologic pattern shown. Such tumors are usually benign; occasionally they are malignant.

I think Dr. Kenyon is to be congratulated for coming remarkably close to the facts in his discussion of this case.

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PENICILLIN SALVE FOR EYE INFECTION

Penicillin ointment is the most effective drug ever used for treating chronic inflammation of the eyelids and their membranous lining, according to Capt. Samuel H. Stein, Medical Corps, Army of the United States.

Captain Stein, writing in the current issue of the *Archives of Ophthalmology*, which is published by the American Medical Association, states that, judging from the results obtained after treating 25 patients with this

ointment, it "is more effective than drugs formerly used" in the treatment of this condition since it gives rapid relief from symptoms and clears the infection.

Only two cases failed to respond to this treatment, therefore the author suggests that these might not have been due to an infection but rather to an allergy. The staphylococci, which also are responsible for boils, were the infectious agents in this series of cases.



CLINICAL CONFERENCES

From the Ward Rounds of the Stanford University Surgical Service at the San Francisco County Hospital, June 28, 1946

Case Number 1. Presentation by house officer, Dr. James J. Hamilton: This 25-year-old Mexican woman, separated from her husband, was well until she fell down six steps on June 6, 1946. She struck her right side just below the rib margin. Bundles, weighing approximately ten pounds landed on the anterior abdominal wall. Right upper quadrant pain caused her to lie on the steps for several minutes. The pain was moderately severe and radiated across the upper abdomen. That afternoon she passed clotted, bloody, vaginal discharge. She entered the ward on June 7, complaining of pain and tenderness, nausea and vomiting and bloody vaginal discharge, all of about 12 hours' duration.

At physical examination the uterus was felt to be enlarged to the left. A fetal heart was heard at 128 beats per minute. There was tenderness over the entire abdomen, more marked in the right lower quadrant.

LABORATORY EXAMINATION

Urinalysis showed 4 plus acetone; no sugar; 4 to 8 white blood cells per high dry field; no red cells. The hemoglobin was 85 per cent; white blood count 22,000 with 93 per cent polymorphonuclear cells.

At 11 p.m., June 7, the tenderness was more marked, chiefly just to left of the umbilicus. The fetal heart was not heard. The cervix admitted one finger. There was marked tenderness in the culdesac not noticed on previous examination.

June 10, the fetal cord prolapsed. Labor was induced with Vorhees' bag. Delivery occurred early on morning of June 11. Vomiting and tenderness persisted. One June 13, the abdomen was distended, the stools were liquid, there was moderate edema of the chest and back. A Wangenstein suction tube was inserted. On June 18 she began to pass bile stained lochia. Jaundice developed and has persisted to the present date.

On June 24, aspiration taps made bilaterally in the lower abdomen showed fluid from which *B.coli* was recovered. Later the same day, exploratory laparotomy was done. An abscess of the entire peritoneal cavity was found. There was thick exudate throughout the abdomen. In post-operative blood studies the hemoglobin varied between 75 and 80 per cent and white count between 7,500 and 10,000.

DISCUSSION

*Dr. Roy Cohn.** We still do not know the answer to this patient's problem. When first seen by the surgical service, three days after entry, she

was extremely ill, with signs and symptoms of generalized peritonitis. We presumed this to have been due to a ruptured viscus which occurred either at the time of injury or secondary to instrumentation. Because of the severity of her illness, the conservative treatment of generalized peritonitis was continued. She seemed to hold her own and gradually localized a large fluid collection in the anterior mid-belly, non-tender to palpation. At this time the patient began having frequent thin bowel movements as if an abscess had ruptured into the colon. With great care the left side of the abdominal fluid collection was aspirated. The same type of fluid that the patient was passing by rectum was obtained. It became obvious that this fluid collection was actually an abscess and not a collection of bile.

Using local anesthesia, the abdomen was opened over the abscess and a large abscess filled with thin brownish *B.coli* fluid was evacuated. The walls were made up of the intestines which were matted together. The pelvic viscera were covered with fibrin but otherwise appeared normal. No source for the abscess was noted.

Since operation, the patient has been improving. Her temperature has fallen and we have been able to remove the nasal suction for the first time. It is possible that her jaundice was only a toxic hepatitis.

*Dr. C. Mathewson.*** It is very difficult to put this whole picture together, particularly in view of the bile in the lochia and stool and the progressive jaundice. Certainly we may rule out obstructive jaundice. A fall causing sudden compression of the abdomen may result in rupture of the bowel in that portion which contains gas, or the bowel may tear at its peritoneal attachments. Looking back, now that we know that this patient did have an intra-abdominal abscess, it is possible to account for the picture on the basis of a rupture of the liver associated with a rupture of the bowel. She put out large amounts of bile in the stool and lochia and also became progressively more jaundiced.

It is rare to see a patient who has just had an abortion, at which time the uterus is wide open and draining, and one who at the same time has a rupture of the liver and bowel with a free flow of bile into the peritoneal cavity. Assuming that such is true in this case, the appearance of free bile in the lochia and stool is not difficult to explain.

Has she a communication between the bowel, the abscess and the abdominal wound? When I

* Roy Cohn, M.D., Acting Assistant Professor of Surgery, Stanford University School of Medicine.

** C. Mathewson, M.D., Acting Professor of Surgery, Stanford University School of Medicine.

saw her the abdominal wound was draining pure bile with little or no fecal content. If there is a fistula in the bowel, and we must assume that there was in the beginning, it is closing over. Continuity of the bowel has been re-established because she is no longer vomiting, is holding down fluids, passing gas and having regular bowel movements. In the immediate future we should watch carefully to see if she has direct communication between the peritoneal cavity and the liver. Now that she is draining bile freely to the outside, the jaundice should clear up rapidly.

Should an abdominal therapeutic abortion have been done? In retrospect, yes. Assuming that she is suffering with a ruptured bowel and liver, early exploration of the abdomen with proper repair might well have avoided the complications which have developed.

Follow-up note: This patient died suddenly on the evening of June 28. At autopsy it was found that the abscess of the peritoneal cavity was the result of a laceration of the terminal ileum. A second, much smaller perforation was found in the sigmoid colon. This was thought to be secondary to rupture of abscess. There was a toxic hepatitis. The jaundice and the yellow color of the lochia were the result of this. There was no communication between the biliary passages and the peritoneum. A few small pulmonary infarcts were found. These were not considered sufficient to be the cause of sudden death. A satisfactory pathological cause was not evident.

* * *

Case Number 2. Presentation by house officer, Dr. Hamilton: A 57-year-old woman entered Mission Emergency Hospital after 70 hours of severe lower abdominal aching and intermittent cramping with nausea and vomiting. She has had no bowel movement since before the onset of symptoms.

Family history is not relevant.

The past history is important in relation to the present illness. In 1913 a left ovarian cyst and the appendix were removed. In 1919 a hernia was repaired. In 1921 she was hospitalized six weeks for strangulation of the bowel. In 1923 she had a second bowel obstruction. She has had known diabetes for the last ten years. She took 30 units of insulin once a day. The fasting blood sugar level was about 150 mg. per cent. Urine tests for sugar done by the patient were usually yellow. On admission 100 units of regular insulin were given.

Flat film shows dilated loops of small bowel. Laparotomy was done and the obstruction relieved. Since operation the course has been uneventful. There has been no recurrence of obstruction. Within 12 hours following operation, 155 units of regular insulin were given. For maintenance she has had regular insulin, 10 units

at noon, and protamine zinc insulin, 30 units at 6:30 P.M. The fasting blood is 129 mg. per 100 cc. of blood.

DISCUSSION

Dr. B. L. Halter:† This patient had been operated on several times. There was a history of chronic bowel obstruction. We were reluctant to treat her conservatively because of the additional problem of diabetes. The use of a Miller-Abbott tube means much wear and tear on the patient and the surgeon, under the best conditions. Because of her severe diabetes it seemed best to get her in proper condition as rapidly as possible and to relieve the obstruction surgically. No person should be denied surgery because of diabetes. In elective cases the diabetes should be primary and the surgery secondary. If the patient is free of acetone, one does not have to worry too much about postoperative complications. The question of the type of anesthesia is important. It is generally believed that any anesthetic can be used. We prefer to use local whenever possible. The difficulty in controlling the diabetes is not completely eliminated at present but is less than it would have been had we tried to treat her conservatively.

Dr. C. Mathewson: I am not in a position to be critical of the judgment used in this case. Generally speaking, a person who has had previous operations for bowel obstruction is a good candidate for subsequent attacks. Once you release the adhesions within the abdomen by surgical means, you may expect new ones to form. It is best to treat this type of recurrent obstruction conservatively whenever possible. However, one must always keep in mind the possibility of strangulation. Such a patient must be kept under constant and careful observation. If the obstruction is not quickly relieved or if there are any signs of localized peritonitis, operation should be performed immediately. Once strangulation has taken place the prognosis is bad unless relieved at once. This patient presented a different problem because of the diabetes. She would have been treated conservatively had it not been for the complicating disease. The fluid loss is often great with the Miller-Abbott tube. This makes control of the diabetes difficult. Surgical relief of the obstruction in this case has met the immediate problem but does not influence the possibilities of future attacks.

Follow-up note: The postoperative recovery of this patient was uneventful. She went home with the diabetes controlled.

† B. L. Halter, M.D., Clinical Instructor of Surgery, Stanford University School of Medicine.



MEDICAL PROGRESS

Current Methods for the Study
and Treatment of Sterility

PENDLETON TOMPKINS, M.D., *San Francisco*

THE principal causes of infertility in the female are pelvic neoplasms, abnormalities of cervical function, occlusion of the fallopian tubes, faulty ovulation, hypothyroidism, pituitary-ovarian imbalance, states of lowered general vitality and failure to have intercourse at the time of ovulation.

Pelvic neoplasms such as polyps, large fibroids, and adnexal cysts usually require removal to ensure the best chance of a successful pregnancy. Major surgery should not be undertaken solely for the purpose of furthering conception until the fertility of the husband has been established.

Disorders of cervical function constitute one of the major problems in the treatment of sterility today. Only recently has attention been given to the normal physiology of the cervix. Pommerenke,¹ among others, has shown that the volume of cervical mucus increases three or four fold just prior to ovulation, then decreases. It is also known that during the phase of ovulation sperm are able to penetrate mucus more readily. It is therefore important to secure and maintain a free flow of normal mucus. Since simple cervical erosions are believed to result from excessive excretion of cervical mucus it seems unlikely that erosions interfere with fertility. So many obstetric patients are found to have small erosions when they are examined for the first time in pregnancy that one begins to wonder whether simple erosions actually promote conception.

ENDOCERVICITIS A MAJOR PROBLEM

Endocervicitis is quite another matter, for infection alters the chemical and physical character of the mucus and by blocking the cervical glands interferes with its production. Hence endocervicitis is a major problem. The usual gynecologic treatment by endocervical resection or "conization" is quite satisfactory in ordinary practice but must be employed with discretion and restraint in treating sterility. If most or all of the infected cervical glands are removed by too radical a resection the remaining secretory tissue may be insufficient to provide a normal supply of mucus. Conversely, inadequate removal of the infected tissue leaves an unhealthy cervix.

Treatment by medicated tampons is both theoretically and practically futile and is obsolete. Intracervical installation of sulfa compounds or insertions of wicks impregnated with penicillin may occasionally be successful. Improving cervical drainage by thorough dilatation and by removing synechia and pockets with the cervical curette is well worth while. The use of a Wylie drain held in place for a month or so by a suture is returning to favor. This is particularly valuable when the cervical canal is sharply bent by an acute antelexion or retroflexion of the uterus. No

doubt the dilatation and curettage which accompany insertion of the drain are responsible for part of its apparent effectiveness. Hot douches have little effect upon endocervicitis; Elliott treatments (a vaginal balloon through which hot water is circulated under constant temperature control) and diathermy are somewhat better. These three forms of thermal therapy increase the blood supply, they have no specific action.

STIMULATION OF CERVICAL MUCUS

Abarbanel,² and Pommerenke³ have shown that normal cervical mucus can be produced in castrate patients by the administration of estrogens. It would therefore be reasonable to try to improve the mucus flow in this way. A deterrent consideration is the possibility of producing an endocrine imbalance in a patient whose prospect of successful conception is dependent upon perfect endocrine function. No doubt we shall hear more about stimulation of cervical mucus by endocrine therapy in the next year or so.

Formerly the usual post-coital test consisted in a microscopic examination of a sample of semen from the vaginal pool. This type of examination, which demonstrated the presence of sperm but gave no accurate information about their number, morphology or function, has been abandoned by all advanced workers. The present-day post-coital examination consists in a study of the cervical mucus four to six hours after intercourse *at the time of ovulation*. As pointed out above, the cervical mucus is normally most profuse and most receptive to sperm during ovulation. For this reason post-coital examinations are made *only* during this phase of the cycle. In arranging for the test the physician predetermines as best he can the date of ovulation and makes an appointment for his patient on the proper day. The technique of the test is simple: a sample of mucus is secured by aspiration or by inserting the closed tips of a pair of thumb forceps high into the cervical canal. Normally a large clear "gob" of mucus is secured. Examination under the high dry lens should show ten or more active sperm per field.

FINDINGS FROM STUDY OF CERVICAL MUCUS

Study of cervical mucus has yielded several interesting findings. The number of leucocytes in the mucus proves to be a much better index of the degree of endocervicitis than simple inspection of the cervix. It is found that sperm readily gain access to the cervical canal regardless of the position of the uterus. Thus retroversion does not cause infertility by making the cervix inaccessible to sperm. The rapidity with which sperm reach the cervix during or after intercourse and the speed with which they progress upward in the cervical canal make one extremely skeptical of

the alleged value of post-coital contraceptive douches.

Michelson⁴ analyzed a series of post-coital examinations and found that if three specimens of mucus are taken from the same patient, one near the external os, one in mid-canal, and one near the internal os, the lowest specimen will show the smallest number, the highest specimen the greatest number of active sperm.

One of the more recondite studies of mucus is the "sperm penetration test." This is accomplished by placing a droplet of ovulation mucus adjacent to a droplet of the husband's semen. Microscopic examination of the junction of the two fluids will normally show the sperm advancing into the mucus in a "flying wedge" formation. If the mucus repels the sperm they will batter at the junction without entering. This constitutes a negative sperm penetration test, presumably indicative of abnormal mucus.

All tests involving cervical mucus and sperm are assumed to have been made within 48 hours of ovulation. Office appointments are scheduled with this intent, yet it may be impossible to be certain, at the time of the test, that the proper day was chosen. Therefore it is essential to re-evaluate the findings two weeks or so later, after menstruation has occurred. By counting back 14 days from the onset of menstruation one determines the approximate date of ovulation. The finding of an occasional sperm on the 14th day before ovulation would be regarded as abnormal, but if the same finding were made on, say, the 19th day, no significance would be attached for at that time the mucus would not be particularly hospitable.

TUBAL OBSTRUCTION

Tubal obstruction is an old problem easily diagnosed by the Rubin test and confirmed by uterosalpingography. Occasional cases of occlusion are relieved by repeated insufflation and courses of diathermy. Salpingostomy may be attempted but only after the patient clearly understands that the chance of success ordinarily does not exceed 20 per cent.

Most of us automatically think of gonorrhea as the etiologic agent in tubal occlusion. There are other factors: tuberculous salpingitis (Sharman⁵ found pelvic tuberculosis in 5 per cent of 840 sterile women), brucellosis, pneumococcus pelvic inflammatory disease,⁶ pelvic peritonitis associated with appendicitis, peritubal adhesions after pelvic surgery, endometrial transplants, and, contrary to most texts, tubal infection following abortions, especially criminal abortions.

Faulty ovulation is a loose term used to describe cases in which conception fails to occur although the endometrial biopsy shows secretory endometrium, the temperature graph shows a fair "ovulation shift" and all other factors are normal as far as can be ascertained. Such patients may go along month after month, then, for no ascribable reason, conceive. One develops the impression that the release of a normal fertilizable ovum does not occur during every cycle in these pa-

tients. The work of Farris⁷ supports this idea, for by means of his new test for ovulation he has been able to predict correctly the cycles in which patients would and the cycles in which they would not conceive. It is probable that within a few years methods for estimating the character or quality of ovulation will prove that conception often fails not for lack of ovulation but because the mechanism of ovulation is imperfect or because an imperfect ovum is extruded.

HYPOTHYROIDISM

Hypothyroidism is the one endocrine disorder associated with sterility which is commonly found, correctly diagnosed and satisfactorily treated. The efficacy of thyroid substance reaffirms our often waning faith in endocrine therapy. It works. Basal metabolism tests should be taken on every couple, man as well as wife. If there is no contraindication, thyroid is administered whenever the rate is below zero; best results are obtained when the metabolic rate is raised to plus five or plus ten.

Pituitary-ovarian imbalance results in irregular periods, amenorrhea or infertility. Diagnosis is made by basal temperature curves, endometrial biopsy, vaginal smears and hormone assays. There is no generally accepted standard treatment whether on the ovarian level with estrogens and progestin, or on the pituitary level with gonadotropins. Many schedules of therapy are proposed, used, applauded and forgotten. One learns to beware of enthusiasm. X-ray treatment of the pituitary and ovary (Mazer's⁸ technique) is successful in some cases of amenorrhea and sterility. That brilliant results have followed its use is without question. There have also been instances of permanent amenorrhea subsequent to treatment. I have seen three.

States of lowered general vitality deserve much thought and effort, and seldom receive it. Fresh air, adequate sport, rest, relaxation, good food, happiness, these are bound to contribute to health and fertility. As Curtis so wisely says in his Textbook of Gynecology, the fertility of animals is immediately reduced upon caging them and too many humans are caged in tight apartments and offices. Others are in psychic cages. We are just beginning to hear discussions of the influence of psychic states upon fertility.

BASAL BODY TEMPERATURE GRAPH

Failure to synchronize coitus with ovulation is a surprisingly frequent cause of infertility. It must be remembered that the ovum is believed to be susceptible to fertilization for only 12 or 24 hours and that the fertility of sperm is not certainly longer than this, so there can only be a short period of 24 to 48 hours during the month when fertilization is possible. This period, the time of ovulation, can be determined fairly accurately by the calendar if the patient has reasonably consistent intervals between periods. But if the intermenstrual intervals varies markedly from cycle to cycle the predetermination of the date of ovulation is almost impossible. In such cases the

basal body temperature graph is indispensable. The graph is plotted by recording the oral temperature taken upon waking each morning. If the temperature graph is to achieve its maximum usefulness it should be recorded by, and its purpose completely comprehended by, the patient. This is greatly facilitated if the patient is supplied with written instructions and a suitable chart for recording her temperatures. Several varieties of forms are available from commercial houses.* These contain both instructions and illustrative sample graphs. (Figure 1.)

The typical normal basal temperature graph for an ovulatory cycle is "biphasic," that is, there is a low temperature level before ovulation and a

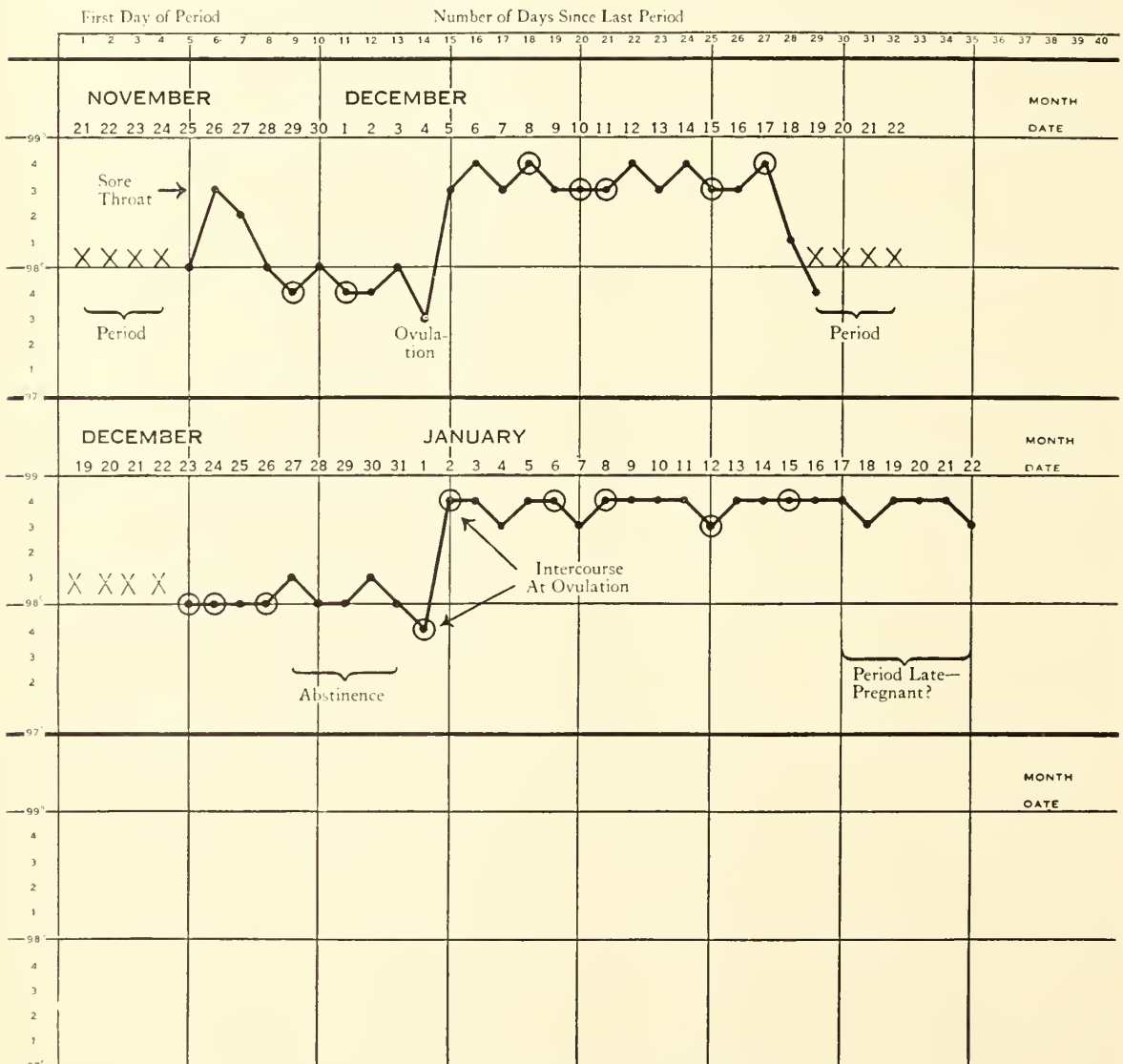
higher temperature level afterward, the shift in temperature occurring close to the time of ovulation. Since the optimum time for conception is during ovulation, the temperature graph serves as a signal. The many uses of these graphs have been discussed in full detail by Greulich,⁹ Martin,¹⁰ Davis,¹¹ and Tompkins.^{12, 13, 14, 15}

During an anovulatory cycle the temperature is flat, or "monophasic." An endometrial biopsy taken prior to uterine bleeding will show proliferative rather than secretory endometrium, thus confirming the absence of ovulation. In such a cycle conception is, of course, impossible.

One of the advantages of employing graphs is that the physician is able to determine not only whether ovulation occurred but also whether intercourse took place close enough to the time of ovulation to make conception theoretically possible. From the therapeutic standpoint faulty tim-

* My own preference is for the charts supplied gratis by the Ortho Pharmaceutical Corporation, Linden, New Jersey.

TEMPERATURE RECORD



ing is tantamount to abstinence, since in neither case is there an opportunity for the sperm to meet the ovum. The treatment is proper instruction, not medication. Two additional uses of the basal temperature graph require mention. If the high postovulatory temperature level is maintained for 18 days or more it is reasonably certain that the patient is pregnant. One can then calculate the date of confinement by adding 266 days (38 weeks) to the date of the temperature shift.¹⁵ This is particularly helpful in cases where the intermenstrual interval is protracted, for in such circumstances the usual calculation of the term date by adding 280 days to the date of the last period will be erroneous.

INVESTIGATION OF MALE STERILITY

Investigation of male sterility requires an accurate sperm count. The most acceptable specimen is one which is collected in a clean glass container by masturbation. Condom specimens are unsatisfactory for two reasons; chemicals in the rubber or in the talc devitalize some of the sperm and an indeterminate number of sperm adhere to the phallus. Withdrawal specimens are also unreliable. Fractional counts show that as many as 75 per cent of the total number of sperm may be contained in the first one-third of the ejaculate. If any of the specimen is lost before withdrawal, as frequently happens, it will be the first portion which contains most of the sperm. Therefore all students of male infertility are agreed upon the necessity of masturbation specimens for accurate counts.

There are two unpardonable errors in advising male patients. The first is to glance at a specimen of semen under the microscope, observe myriads of sperm and, without making a count, to assure the patient that he is "perfectly normal." Just as the hematologist requires both a leucocyte count and a differential count before reaching a conclusion, the investigator of sterility must make a sperm count, a differential count and a test of the duration of motility of the sperm. Not until at least two specimens have been studied is an opinion justified. Normal specimens contain 100 million or more sperm per cubic centimeter of which 80 per cent are morphologically normal. A count of less than 60 million indicates relative infertility, the degree of fertility being roughly proportional to the count. Complete absence of sperm in the semen (azoospermia) usually means vaso-epididymal occlusion. Testicular biopsy, a simple procedure requiring only a few hours' hospitalization, will differentiate between failure of spermatogenesis and occlusion. Biopsies are being relied upon more and more for accurate appraisal of the degree of infertility and for prognosis.

The treatment of oligospermia is discouraging. During the recent meeting of the Society for the Study of Sterility I asked seven prominent students of male sterility whether they knew of any treatment of oligospermia which was of proven value. Six members of the Society answered

flatly, "No"; the seventh said that he hoped to have something to report in a year or two. On one point all were agreed; that administration of testosterone lowers the sperm count. Although there is no certain method of successfully treating oligospermia, azoospermia due to obstruction may be relieved. Michelson¹⁶ has developed a new technique for vaso-epididymal anastomosis in which he produces a permanent vaso-epididymal fistula by means of a stainless steel wire. Charny of Philadelphia has reestablished potency in some cases by flushing out the vas. The brilliant results which are sometimes obtained by urologists specifically interested in the treatment of male infertility must be kept in mind. As pointed out above, it is wrong to make a diagnosis of normal fertility without a complete sperm count. Conversely, it is equally poor practice to commit oneself to a diagnosis of hopeless sterility without first securing the opinion, in consultation, of a urologist who has trained himself in the investigation and treatment of male infertility.

This summary will be closed with a word about results. More than 40 per cent of women who apply for treatment of infertility subsequently bear children. Before taking to ourselves too much credit for this happy outcome we should remember that conception is normally to be expected, that time alone is a great healer, that thousands of women conceive after years of barrenness without treatment and that no "control series" are available in sterility studies which enable us fairly to appraise our results. Nor should our critical evaluation of treatment be biased by the praise of patients whose gratitude so often leads them to give us more credit than we deserve. We can best preserve our intellectual honesty and maintain a scientific balance by remembering the example set by Ambrose Paré who brushed aside praise with the immortal reply, "I dress the wounds, God heals them."

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INDUSTRIAL REHABILITATION CENTER IN BRITAIN SUCCESSFUL

A British industrial psychiatrist describes the successful work of England's first industrial Rehabilitation Center, which treats patients suffering from occupational and social maladjustments, in the current issue of *Hygeia*, health magazine of the American Medical Association.

Thomas Ling, M.D., who has been Medical Director of Roffey Park Rehabilitation Center since its opening, says that "during one 12 month period 580 men and 460 women have been treated with satisfactory results. Many of the cases were medically and psychiatrically difficult and a minority were complicated by insoluble social problems. It is often difficult to classify the cases exactly, but the greater number were suffering from occupational and social maladjustments."

Rehabilitation, the author explains, is a form of scientific treatment which should be a part of medical therapy of all illnesses. The better and earlier the treatment, the fewer will be the cases of permanent disability which will require vocational training and the more satisfactory the results in those so trained.

Roffey Park operates in the following way, according to Dr. Ling:

"The Center provides residential facilities for 100 patients of both sexes between the ages of 18 and 50 years. Priority of admission is given to employees of subscribing firms although admission is not limited to patients from such sources.

"Each patient is given a thorough examination and psychiatric interview, together with appropriate intelligence and aptitude tests. The patient is also interviewed by the social worker who has had wide industrial experience.

"Emphasis is placed on the treatment of each case with physical, occupational and psychologic features receiving due attention. Occupations for men consist of engineering workshops, woodwork, wood-sawing and gardening.

Women's occupations consist of domestic work, needlework classes, gardening, art classes, assisting in the nursery (established on the premises for children of the staff) and training in elementary dietetics. Unless there are medical contraindications, each patient carries out a daily graded course of physical training.

"Three resident psychiatrists and visiting specialists are available. Patients are seen by the doctor in charge at least twice a week and more often if necessary. Problems in the patient's life are discussed and help is given toward eradicating them. In some instances difficulties have arisen at work, in others at home. In others the problems may be of a more deep-seated nature. A full understanding of the patient's working background is essential and close contact is kept with the office or factory from which the patient has been sent.

"Each evening a communal activity, including discussion groups, gramophone recitals, amateur theatricals, motion picture shows and dances, is arranged for the patients.

"Patients remain for an average period of six weeks. Before discharge careful attention is given to subsequent placement at work. The majority of the patients are able to return to their normal employment, but some present a problem in placement. To help in this work, Britain's Ministry of Labor officials visit the Center each week."

The author emphasizes the fact that Roffey Park has proved a first-class success since its establishment in 1943. A sum of approximately \$300,000 was subscribed from industry at that time and a large country house, 30 miles from London in Horsham, Sussex, was purchased. It is maintained by a number of leading employers in the country. Dr. Ling hopes that "industry will sponsor additional centers in the future and, ideally, there should be at least one such hospital outside each big city, linked up with the main industries of the district."



CALIFORNIA MEDICAL ASSOCIATION

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FOR COMPLETE ROSTER OF OFFICERS, SEE ADVERTISING PAGE 2

NOTICES AND REPORTS

Program of the Cancer Commission

LYELL C. KINNEY, M.D.,* *San Diego*

DURING the April campaign of the American Cancer Society \$770,000 was contributed in California. Forty per cent of that contribution will be sent to the National Headquarters for cancer research. The members of the Cancer Commission must share with the other members of the state board of directors the responsibility of seeing that the remaining 60 per cent of the public funds is spent wisely and most effectively in cancer control projects and for statewide service to cancer patients.

In spite of the splendid work now being done by physicians in the treatment of cancer, the death rate from this disease in California is still 1,000 each month and we as physicians can effectively lower that mortality.

The educational program of the Commission aims to bring forcibly to all physicians the new facts concerning diagnosis and treatment of cancer, to make the physician more cancer-conscious and to stimulate a sustained program of regular periodic physical examinations to detect early cancer in private practice.

The Commission is preparing a three-fold educational program. With the generous cooperation of the faculties of the medical schools in Los Angeles and San Francisco, short refresher courses in cancer will be offered for the physician. These courses will be subsidized by the American Cancer Society so that they can be well organized and given free, without additional expense to the medical schools. The members of the Commission will assist in arranging the program of these refresher courses and will keep the profession fully informed about these opportunities.

In order to bring cancer education to the physicians, the Commission is preparing a panel of speakers and programs on cancer that will be available to the county medical societies. The extent of these programs will be suited to the needs

and wishes of the county societies. They may be for a single medical society meeting, or they may be extended to a Cancer Day including symposia, clinical demonstrations and a public meeting on cancer. After the program is established it is planned to offer short refresher courses on cancer in strategic locations throughout the state where they are requested by the county medical society or a group of county societies.

The Commission is now preparing a cancer manual to be distributed to the members of the California Medical Association. This will be the first revision of the pioneer Cancer Studies prepared by the Commission in 1934. The manual will be published in serial bulletins that can be bound in a loose-leaf folder for reference in order to keep the information up-to-date and to make a continuing educational program. This manual, which is a major task, is in the hands of an editorial committee consisting of Doctors L. G. Dobson, C. J. Berne and Otto Pflueger.

The Commission is also preparing to keep in close touch with the cancer clinics throughout the state. The members of the Commission and its executive secretary will be ready to advise and plan with cancer clinics, particularly those that are receiving subsidy from the American Cancer Society. Also, the Commission will be prepared to assist and advise in organizing new cancer clinics where they are feasible and where an adequate staff is available. In order to assist new clinics to organize and to obtain financial support, the Commission has prepared minimum standards for approval at the state level.

Detection clinics for the examination of well persons to discover early cancer or early chronic disease are becoming an important factor in the national public health program. There will be an increasing public demand for such clinics. Foreseeing this need, the Cancer Commission is prepared to assist any county medical society to plan and establish detection clinics at their request.

The Commission is prepared to cooperate with

* Chairman of the Cancer Commission.

the county medical society and the State Department of Public Health in conducting a cancer survey in any county in the state. The Council of the Los Angeles County Medical Society has approved a cancer survey in that county in which the Cancer Commission will take an active part.

The local problems in cancer control are necessarily the responsibility of the county medical society and indicate the appointment of a strong cancer committee consisting of members interested and experienced in cancer. The Commission and its executive secretary will be ready to advise with the county cancer committees and to assist them in working out their local problems.

A central tumor registry for California is essential for correlating and evaluating the diagnosis and treatment of cancer in this state. The Commission has undertaken to develop this central tumor registry and has the assurance of the cooperation of the California Department of Public Health in this project.

In addition to these official activities of the Commission, the members as individuals are taking active part in the California division of the American Cancer Society. The California division is a voluntary public health corporation representing the work of the American Cancer Society and its Field Army. Both at the state level and in the chartered county branches the administration of the Society is in the hands of boards of directors. At both levels the Cancer Society is enlisting outstanding business men, community leaders in education, health and public welfare, as well as the medical profession to participate in the work and serve on the directing boards.

The members of the Cancer Commission are automatically, through the by-laws, included in the board of directors of the California division. On the county level the members of the Cancer Committee of the county medical society are members of the board of directors of the county branch. It is the national policy as well as that of the California division that all medical policies shall be determined and supervised by physicians.

The primary objectives of the American Cancer Society in California are the education of the public in cancer, service to cancer patients, subsidizing cancer facilities and raising funds for these objectives on the state level and for cancer research on the national level.

In every public health program, whether it be venereal disease, tuberculosis or cancer, the most important weapon is education of the public. With the slogan "Much Early Cancer Is Curable" the Society will conduct a statewide educational program to acquaint the public with the danger signs that may mean cancer and impress the need for immediate examination and treatment when these signs are present. Also, the public is being educated in the need for periodic health examinations to discover cancer while it is early and curable. In the larger cities educational centers are being set up as a clearing house for educa-

tional projects and to which the public may go with their suspicions and problems and receive proper direction. Cancer literature is being widely distributed and this will include literature in Spanish and other foreign languages. The educational program includes speakers for lay meetings and a public school program in the departments of biology and hygiene.

The service program of the American Cancer Society is directed to provide better facilities for the diagnosis and treatment of cancer. Funds are available to provide increased facilities in existing cancer clinics. Financial assistance will be given in the establishment of new clinics to provide personnel, instruments and supplies and for follow-up service. Similar support will be given to approved detection clinics when they are organized. The service program also includes payment for free or part-time beds and special examinations for needy cancer patients. Provision can also be made for home nursing, surgical supplies and transportation for needy patients. Where it is possible to obtain them the California division will subsidize hospital beds for advanced cancer patients.

The ultimate success of the entire cancer control program depends upon the cooperation and support of the medical profession. The Cancer Committee in each county medical society should be the leader in that cooperation. To this end the members of the Cancer Committee should be men and women who will take an active interest in the cancer program and work on the board of directors and executive committees of the county branches of the American Cancer Society.

The American Cancer Society will spread information and publicity about cancer and will refer inquiring patients to the county medical society. However, this will be rather futile unless there are physicians in each county who are willing to accept these patients for prompt examination and diagnosis and who will see that they receive immediate effective treatment. Some of the referred patients in the lower income groups must be sent to tax-supported hospitals and clinics for treatment, but the local Cancer Committee should work out a general referral system to save public confusion and to obtain prompt action. The San Francisco County Medical Society is preparing a panel of physicians who will accept cancer cases. This program is acceptable to the county medical society and should be welcomed by the public.

The lay educational program of the Cancer Society presupposes a group of physician-speakers in each county who will talk on cancer to lay groups when requested. The selection and maintenance of such a speakers' bureau is a necessary function of the Medical Society's Cancer Committee. The Committee can also interest itself and the Medical Society in detection clinics or cancer clinics when they are feasible and secure the participation of physicians in these facilities. The Committee can evaluate the financial support necessary for these cancer projects and secure re-

quired funds for them through the county branch of the Cancer Society.

The public is cancer-conscious and is willing to contribute funds to the cancer program, but they will only do so as long as that program is effective. The maintenance of an active cancer service program in each county is essential and this can be done only with the leadership and continued cooperation of the local medical profession.

While the work of the Cancer Commission of the California Medical Association will be largely

at the state level, the members of the Commission and the executive secretary will be prepared to work with the Cancer Committee of each county medical society and cooperate with them as they may request. The Commission will conduct an educational program for physicians, they will try to increase cancer facilities in the state and they will endeavor to assist the medical profession in their relation to the cancer control program. The Commission will cooperate as fully as possible with the American Cancer Society and the California Department of Public Health.

1831 Fourth Avenue.

DR. McCARTHY NAMED EXECUTIVE MEDICAL DIRECTOR OF CANCER COMMISSION

William D. McCarthy, M.D., of Oakland, was appointed Executive Medical Director of the Cancer Commission of the California Medical Association on July 22. Dr. McCarthy will also serve as Chairman of the Educational Committee of the American Cancer Society, California Division.

This appointment fills an urgent need in making it possible to carry out the far reaching service and educational projects of the American Cancer Society, California Division, which are coordinated with activities of the Cancer Commission. The Executive Medical Director will assist the standing committees of the Commission, initiate and conduct a cancer survey of the State of California, visit the various County Medical Societies to assist in arranging their cancer programs, and collaborate with the American Cancer Society. Part of Dr. Mc-

Carthy's duties will be to investigate and aid existing cancer clinics, as well as to assist in the formation of new clinics.

Dr. McCarthy is well qualified for the position of Executive Medical Director. He received his M.D. degree from Cornell University Medical College in 1935. Post-graduate training includes an internship at the Jersey City Hospital, surgical residency at Bellevue Hospital, a fellowship in cancer at Memorial Hospital, and a surgical fellowship at the Lahey Clinic. A few months before the United States entered the war, Dr. McCarthy established private practice in Oakland, and became the Associate Director of the Alameda County Tumor Clinic. During his tour of active duty in the Navy, he was one of the prime organizers of the Tumor Clinic at the U. S. Naval Hospital, Oakland.

New Industrial Medicine Fee Schedule

New fees for industrial medical and surgical cases will be put into effect in the near future. This good news came from the Industrial Accident Commission of the State of California following its meeting of June 18.

The new fee schedule contains about 535 items and goes into enough detail to enable any physician to determine the exact fee which is due him for services performed on compensation cases. This replaces the old 1920 fee schedule of the Industrial Accident Commission, a schedule which covered only about 87 items.

In acting on the new schedule the Industrial Accident Commission approved a compromise schedule based on the original request of the California Medical Association presented to the Commission in December, 1942. Since the first presentation, the Commission has held one public hearing, two interim committees of the Assembly have taken testimony on the inadequacy of compensation fees for medicine and surgery and a special study committee appointed by the Industrial Accident Commission has held numerous meetings. The net result of all this consideration was a compromise by the Commission's special study committee, the compromise recognizing the fairness of most of the surgical fees requested by the C.M.A. but reducing the fees for office, hospital and home visits.

As adopted by the Commission, the new schedule represents about a 25 per cent increase in the fees for surgical procedures and an increase of from 20 to 30 per cent

in the fees for visits. Largest increase in the visit fees was in the case of office visits subsequent to the first visit; in this case the Commission increased the old fee of \$1.25 to \$2.00.

Just what overall percentage increase over the old fees is represented by the new schedule has not yet been officially determined. One insurance carrier has estimated an overall increase of 40 per cent but this figure may be open to question.

All C.M.A. members will be provided with a copy of the new schedule of fees just as soon as the Industrial Accident Commission has, set the effective date for these fees. This is now expected to be around September first. *Meanwhile, compensation fees in effect are the old fees plus the fifteen per cent surcharge which has been in effect for the past two years.* The surcharge will be removed when the new fee schedule goes into effect.

Members are requested to put the new fees into use just as soon as the effective date is announced and new copies of the schedule are distributed. Members are also cautioned against the attempts which may be made by some insurance carriers to discount from the new fees or to solicit the care of compensation cases at a percentage off the new fee schedule. Undoubtedly some such attempts will be made. The California Medical Association has put itself on record as being unalterably opposed to such practices and has met the threat of such tactics by announcing that it stands ready to take any fee dis-

putes before the Industrial Accident Commission. The Commission is authorized by law to establish fair medical and surgical fees in cases where such fees are in dispute; in such cases the Commission relies upon the schedule of fees which it has officially adopted. Accordingly, there is no need for any C.M.A. member to submit to a reduction of the officially adopted fees.

Provision will be made in the fee schedules which are sent to our members to notify them of their rights in cases of disputed fees and to provide for the proper reporting of such cases. The C.M.A. stands ready to furnish legal representation and to prosecute all such cases before either the Los Angeles or San Francisco offices of the Industrial Accident Commission.

It is hoped that fee disputes in compensation cases will be kept at a minimum number. However, where they do arise they should be promptly and adequately handled so that the physicians rendering services under the com-

pensation laws may not be deprived of their rightful fees. It is believed that the large majority of insurance carriers will accept the new fee schedule without question, particularly since it represents the Commission's official action on a schedule presented by a study committee which the insurance companies themselves suggested and on which the insurance companies had some eight representatives and the C.M.A. only one.

Watch for your copy of the new schedule. It will be sent to you as soon as the effective date of the schedule is determined and new copies printed. Your secretary will want to keep this schedule in her desk for the billing of compensation cases and the schedule will be prepared in a form suitable for this purpose.

When the new fees do go into effect they will represent the culmination of three and one-half years of effort by the C.M.A. to bring up to date and to make more complete the old 1920 schedule.

CALIFORNIA PHYSICIANS' SERVICE—MEMBERSHIP DRIVE

Propelled by an intensive sales effort and stimulated with precedent-shattering advertising campaigns over the air and in the newspapers, enrollment in the California Physicians' Service, this month, passed the quarter million mark. An all-time high—251,246 persons now enjoy its protection.

June and July broke all enrollment records when a total of 51,919 Californians became members of their 'own family physician's plan' for prepaid low cost, medical, hospital and surgical care.

This exceptional growth can be more readily appreciated when it is noted that as of August 1 of this year C.P.S.'s membership totalled nearly 100,000 more than one year ago.

Physician membership has kept pace with this phenomenal enrollment increase.

During the past 12 months, 1,584 of California's professional men have become associated with C.P.S., bringing the August 1946 total to 7,155.

This hand-in-hand growth argues well for greater accomplishments in the months to come.

C.P.S. representatives attribute no small part of their recent success to the participation in the Voluntary Health Insurance Weeks conducted by the California Committee for Voluntary Health Insurance. C.P.S.'s part of the campaign is to run the California Medical Association-sponsored advertising in every paper, both weeklies and dailies, in the County, and to participate in the publicity built around the local County Medical Society.

During these weeks dual dividends are developed.

The immediate result, the one you can touch and feel and count—is an increase in memberships in the community where the Health Week event is being conducted.

The second result, immeasurable though it may be for the moment, is better public relations for the entire medical profession.

Here—no magic wand can be waved to accomplish miracles. Miracles are no more easily accomplished in the field of public relations than they are in any other profession.

However, where the local physicians give more than mere lip service in the preparation for and the conduct of the Health Week exceptional dividends have resulted.

The preliminary plans for Health Week are designed to *put the local physicians to work*. This "design" is no mere accident on the part of the C.P.S. public relations personnel. Past experience has shown that the local doctor actually does not know his own strength when it

comes to affecting opinion through education in local affairs.

He is therefore asked to interview the Mayor of his town, explain the objectives of Voluntary Health Insurance Week, and encourage him to issue a proclamation declaring Health Week at the start of the campaign. Another physician is assigned the local State Senator or Assemblyman who is asked to serve as Honorary Chairman during Health Week.

Still another, usually the most capable orator of the County Medical Society, is made Chairman of the Speakers' Bureau for the Week. It is his duty to assist in arranging speaking dates and to make the talk before the dinner-meeting of leading civic, business, farm and professional leaders which precedes the inauguration of Health Week.

In communities where the physicians have made a real effort to secure speaking dates before service clubs and other civic organizations during Health Week, they have found an attentive and receptive audience awaiting their exposition of the dangers of compulsory health insurance and the advantages of voluntary systems.

By word of mouth and by way of the attendant publicity they've been able to convey to the public that they *are*, through C.P.S., providing a sane, sensible program of low cost health protection. Physician-speakers point out the absolute necessity of maintaining their present high standards of service if medical progress is to continue. On the other hand, these professional men in their Health Week talks, have been given the opportunity to drive home the fact that "bad medicine" can be the only result when a politician separates the physician and his patient as would be the case under a system of political compulsion.

While these plans are going forward on the part of the profession, C.P.S. sales representatives plan their intensive sales campaign to capitalize upon the advertising and publicity which is generated.

A local office is opened in the community. Special letters, which the President of the County Medical Society is asked to sign, are mailed to all leading employers with appropriate literature.

Members of the sales and public relations staff of C.P.S. also schedule talks before service clubs where they get over a direct sales message to the community's opinion-moulders.

Physician members are called upon for assistance where C.P.S. representatives need "door opening" aid.

Membership continues to increase long after the con-

clusion of the campaign. The score card on some of the more recent events shows the following results:

Ventura County	2,200
Orange County	2,300
Santa Cruz County.....	2,000
Solano County	2,000
Kern County	1,800

It will be noted that most of the above counties are relatively small. This being the case, the per-member cost in certain instances is higher than C.P.S.'s ordinary operation.

Certain reasonable accounting changes are now being contemplated to assess this additional expenditure to public relations and not make it a direct charge against selling.

Campaigns in the larger metropolitan areas such as Los Angeles, San Francisco, Alameda and San Diego Counties, are planned for early in 1947. Health Week in Sacramento County, no doubt, will be conducted while the Legislature is in session next Spring.

Enlarging upon the experienced gained while offering C.P.S. protection to Farm Security Administration borrowers, C.P.S. has now embarked upon an even wider field—a contract with the California State Grange.

There are more than 20,000 Grange members in the State. The members, plus their families, plus their employees and their families, offer a great new potential field of more than 50,000 persons—all eligible for C.P.S.

The enrollment program is now under way. C.P.S. representatives have explained the "C.P.S.-Grange Co-operative" to 291 individual subdivisions of the Grange at every nook and corner in the length and breadth of our great State.

Grange members, hardy exponents of free enterprise and American initiative, have been quick to realize the importance of maintaining high medical standards in California. To date, through their cooperation, 84 Granges, representing a total of more than 7,000 persons, have enrolled. All of these groups have met the 50 per cent participation requirement.

And, once the plan explained, Grange members themselves have handled the details of enrollment.

This daring venture on the part of C.P.S. has brought a flood of inquiries from other farm organizations both in California and throughout the Nation. It is expected to open great new vistas for enlarged rural memberships.

Incidentally, once in full swing operation, C.P.S. will be in possession of the latest and most reliable actuarial information on medical care costs for farm groups. This should serve as an accurate guide post for future operations.

Going on the theory that "you can't be sold until you're sold yourself," C.P.S. now accepts physician members, their families and their employees as beneficiaries. From C.P.S.'s immediate viewpoint, this has been an important step since it familiarizes the physician, his family and his staff with the advantages of C.P.S.—what the mem-

bership card means in time of prolonged illness or unpredictable accident.

Enrollment in this particular classification is reopened every four months. During the April sign-up 1,899 persons were added to the C.P.S. list, bringing the total number covered to 3,800.

Support of compulsory health insurance has come from the CIO and other similar groups. Their activity in many instances has spurred otherwise conservative civic and employer groups into action in support of voluntary health insurance programs.

The California State Chamber of Commerce, Pro America, Glendale and Stockton Chambers of Commerce are among the latest important organizations to endorse the physicians' stand in opposition to State medicine.

The San Francisco Employers Council, in its most recent report to its members, declared:

"The medical profession and other groups favoring free enterprise are resisting government controlled compulsory insurance as a step in the direction of socialized medicine. They contend that these needs can best be met by an extension of existing voluntary programs.

"Many, if not most of the larger member firms of the Council already have in effect some form of medical, surgical or hospital benefits covering their employees. Until recently it was not possible for the smaller employer to procure this type of coverage because of an insufficient number of employees.

"It has been the feeling of the Board of Governors that medical, surgical and hospital coverage affords better protection and security to the employee than the granting of a few days of paid sick leave. Employees have in the past and probably in the future will be able to finance a few days' absence from work because of illness, but the expenses of medical, surgical and hospital attention at times work a severe hardship and financial strain on the employee which the prepaid plans, by distributing the cost over a large group, are designed to care for at reasonable cost to each individual."

During recent weeks enrollment has proceeded with such large employers as Bordens Dairy, The May Company and the San Bernardino Air Base.

Union Oil Company and the Texas Company, and now the Southern Pacific, have asked for a proposal for surgical and hospital care for the dependents of their employees.

The Northern California Druggists' Association, following an endorsement of the California Pharmaceutical Association, has approved an enrollment program for all drug store employees.

So grows C.P.S. . . .

And, as C.P.S. grows in favor and public acceptance and appreciation, so diminishes the probability of political medicine!

CHESTER L. COOLEY, M.D., San Francisco,
Secretary.

Notices of changes in memberships of County Societies are printed on Advertising Page 14, obituaries on Advertising Page 7, and rosters of officers of the California Medical Association and the Women's Auxiliary on Advertising Page 10.



NEWS and NOTES

NATIONAL • STATE • COUNTY

ALAMEDA

Alameda County branch of the American Cancer Society has announced establishment of headquarters at 121 East 11th Street, Oakland, and has set up a booth in the H. C. Capwell store to give the public information in regard to early recognition and treatment of cancer. The booth will be staffed six days a week by volunteers from the Women's Medical Auxiliary and other women's organizations.

A blood donor center has been established at 285 12th Street, Oakland, by Cutter Laboratories. The company said that the center, which can handle more than a hundred paid donors daily, was needed to serve the increasing medical demands for human blood fraction products. This is the second such establishment set up by Cutter. The other, in San Francisco, has been in operation for the past two years.

Chamber of Commerce Survey shows that physicians interviewed are generally in favor of a new hospital in the San Leandro area. However, many doctors believe the hospital should accommodate at least 100 beds instead of the proposed 75. The favored site for the new hospital is close to San Leandro, between the easterly city limits and 150th Avenue, the survey showed.

CONTRA COSTA

Dr. Charles H. Jessup has been assigned to the staff of the Contra Costa County Hospital, Martinez. Dr. Jessup, a graduate of Marquette Medical School in Milwaukee, was recently released from the Navy. He succeeds Dr. Maurice Fishbein, who has gone to San Francisco to resume his studies. Dr. Waltin Joseph Ray also joined the County Hospital staff recently, replacing Dr. E. H. Morken, who is on vacation and leave of absence.

FRESNO

Dr. Leo M. Goodman has opened an office in the Boucher Building, 2050 Amador Street, Fresno, after four years in the Navy. Dr. Goodman was formerly the resident physician at the Fresno County General Hospital and assistant to Dr. H. M. Ginsburg, who recently resigned as director of the hospital.

Dr. Elmer Hof has resumed his Fresno practice in his newly completed nine-room clinic at the southeast corner of Olive and San Pablo Avenue. Dr. Hof, who has just returned from two years of service with the Coast Guard, received his medical training at the University of Kansas and served his internship in the Southern Pacific Hospital in San Francisco.

KINGS

The resignation of Dr. C. T. Rosson, Sr., as county physician has been announced by Chairman Russell Troutner of the Kings County Board of Supervisors. Dr. Rosson is replaced by Dr. Charles Hedges, formerly of Charleston, West Virginia.

Dr. William L. Dittes, who until recently served as a lieutenant in the Navy Medical Corps, has returned to private practice and is now associated with Dr. L. W. Sorenson in Corcoran.

LOS ANGELES

Dr. Arthur O. Stewart, who was discharged from naval service on June 15, has resumed private practice at 320 North Glendale. While in the Navy, Dr. Stewart was in charge of the department of anesthesia at the naval hospital at Long Beach.

Dr. James R. Spencer has been appointed resident in surgery at the Huntington Memorial Hospital, it was announced by officials at the hospital. Dr. Spencer, just released from active service as a Navy medical officer, attended the University of Texas Medical School, graduating as a Navy V-12 student in 1944.

Physical Medical Training for Physicians at the Los Angeles County General Hospital has been approved by the American Medical Association, according to a communication from Leroy R. Bruce, director of the institution. The present head of the physical medicine department of the General Hospital is Ora L. Huddleston, M.D., formerly with the University of Colorado and the Fitzsimmons General Hospital of the U. S. Army at Denver.

Lt. Col. Kenneth W. Taber of the U. S. Army Medical Corps has just received a three years' appointment to Johns Hopkins Medical School through the Dean's Committee and will specialize there in radiology and cancer research. Before serving with the Army, Colonel Taber practiced medicine for 13 years in Pasadena and during that time was on the faculty of the University of Southern California Medical School.

Dr. Charles C. Levy who recently returned from overseas service, has opened an office at his home, 720 Screenland Drive, Burbank.

Dr. Albert J. Miller of Azusa has announced his intention to enter medical practice in Monrovia. He will be associated with Dr. Robert E. Crusan. Dr. Miller returned from overseas service with the Army about two months ago. Much of his time with the Army was spent at Heidelberg University where he engaged in medical research.

Dr. Roy O. Gilbert of Sherman Oaks became acting county health officer for Los Angeles County July 1 when the resignation of County Health Officer H. O. Swartout became effective. Dr. Gilbert's appointment covers the months of July and August. On September 1 the Board of Supervisors is expected to set up a County Health Commission which would serve in conjunction with Los Angeles City Health Officer George M. Uhl to administer health affairs of all cities of the county, including Pasadena. Overtures will be made to the cities of Pasadena, Long Beach, Beverly Hills and Vernon asking them to join with the City of Los Angeles in becoming part of a unified county health program.

MADERA

Dr. Ellis D. Jamison has been appointed by the Madera County Board of Supervisors as resident physician of the Madera County Hospital to succeed Dr. Roland Young, who resigned to practice in Quincy. Dr. Jamison graduated from Stanford University and served his internship in the Fresno County Hospital. He was recently discharged from the Army.

ORANGE

Wintersburg Grange was the first in Southern California to report a majority sign-up of members for benefits of the State Grange-California Physicians Service prepaid health cooperative. Many other Granges in Southern California are now actively engaged in obtaining sufficient sign-up of members to qualify for C.P.S. affiliation. It is expected that a considerable number of them will report success.

SAN DIEGO

Dr. Stephen E. Flynn has returned to Coronado after having been absent since the beginning of the war. Dr. Flynn was senior medical officer aboard the cruiser USS Columbia and received the Bronze Star and Navy Unit Commendation for meritorious conduct in line of his profession at Lingayen Gulf, Philippine Islands, in January, 1945. Dr. Flynn's new office is located at 1024 Isabella Ave.

SAN FRANCISCO

Dr. William McDowell Hammon, noted University of California epidemiologist, has been appointed dean of the school of public health on the Berkeley campus of that institution. Dr. Hammon, a leading authority on encephalitis, was called to Okinawa during the war to aid in controlling outbreaks of the Japanese "B" encephalitis among American troops. Earlier this year he went to Tokyo to advise General Douglas MacArthur's command on the same subject. Dr. Hammon received his M.D. at the Harvard Medical School and a degree of Doctor of Public Health at Harvard. He also studied in Belgium and was a member of a hospital staff in the Belgian Congo. He replaces Dr. Walter H. Brown, who recently retired.

Dr. Philip K. Gilman, former president of the California Medical Association, has been installed as president of the Society of State Medical Associations. He succeeds Dr. Andrews Brunk of Michigan.

SAN MATEO

Dr. William G. Schmitz and **Dr. Philip Vogel**, both recently discharged from the Army's medical service, have leased offices in the Bachelder Building, 201 Broadway, Millbrae, where they will be associated in private practice.

Return of 22 doctors to practice after serving in the armed forces is announced by officials of the San Mateo County Medical Society. Resuming their practices are Doctors E. G. Gamette, V. H. Heinz, Gordon Morrison, P. A. Seeley of Burlingame; Paul Anzinger, J. G. Bridgman, T. E. Farthing, J. K. Hazel, O. M. Holmes, Martin Karr, William Layton, A. G. Miller, W. W. Mills, R. R. Moulton of San Mateo; Norman Fox, Werner Glasser, Harry Smith, of San Bruno; Bard Berry, Dewey F. Brown, W. B. Hurlbut of Redwood City; R. D. Borley of Half Moon Bay, and S. J. Guardino of Brisbane.

SANTA CLARA

Dr. W. Elwyn Turner has replaced Dr. Cecil M. Burchfiel as county health officer of the Santa Clara County Board of Supervisors. Dr. Burchfiel's resignation was accepted with regret. Under his direction the staff of the department was increased and the scope of the work enlarged. Dr. Burchfiel is a graduate of Washington Medical School in St. Louis.

RIVERSIDE

Dr. Earl M. Edison has opened offices at 1317 East Las Tunas Drive, San Gabriel, in the premises occupied

by Dr. Raymond O'Connell. Dr. Edison, a graduate of Northwestern University, has been out of the Army approximately eight months, during which time he has been associated with Dr. Lawrence Butka of Alhambra.

TULARE

Dr. Rodney F. Wood has opened offices at 132 North M Street, Tulare. Dr. Wood recently returned from military service.

Stanford University School of Medicine has announced 11 postgraduate medical courses for practicing physicians, and the **University of California Extension Division** will offer three. All the courses begin in September, all will be held in San Francisco.

The Stanford courses, given in cooperation with the San Francisco Department of Public Health and the San Francisco Hospital, include Internal Medicine, Pediatrics, Ward Rounds in Surgery, Obstetrics and Gynecology, Otorhinolaryngology, Cardiovascular Disease, Hypertension and Nephritis, Surgical Anatomy and Operative Technique, Proctology, Ophthalmology, and Anesthesiology. They will be given September 2-6, inclusive. In addition there will be a general meeting on Arthritis, in Lane Hall, Tuesday evening, September 3, and another on Thoracic Surgery at the same place the following Thursday evening.

U. C. Extension courses include: Venereal Disease Diagnosis, Treatment, and Control, with lectures beginning September 13 and ending January 10, 1947; Internal Medicine, beginning September 23 and continuing to December 9; A Refresher Course in Psychiatry, to be given at the Langley Porter Clinic, starting September 16 and continuing for 12 weeks.

Distribution of a questionnaire to physicians as a part of a nation-wide study of Child Health Services is planned for early September, it is announced by the American Academy of Pediatrics which is conducting the study. Purpose of the questionnaire is to determine the extent and availability of existing child health facilities in each community.

The questionnaires are simple, one-page forms and are to cover one specific day of the week.

"Cooperation of physicians in furnishing the required information for study is essential for the success of the program," the Academy says, "and it is important that the questions be answered correctly and for the specified time, even though that day may not be representative of the answering physician's practice, so that an accurate over-all picture can be obtained."

The Academy's announcement says that the entire program has been approved by the American Medical Association, California Medical Association, California Dental Association, and the State pediatric groups.

Inquiries may be addressed to the American Academy of Pediatrics Study of Child Health Services, 2180 Washington Street, San Francisco, 9.

Appointment of four California surgeons as consultants to the Secretary of War through the Surgeon General has been announced by the War Department.

The four from California, who are among 74 physicians and surgeons in the country named to similar positions, are: Sterling Bunnell, San Francisco, plastic surgeon; and three general surgeons—Meridith Beaver of Redlands, Carleton Mathewson of San Francisco, and Gordon K. Smith, Los Angeles.

"Appointments were made," the War Department said,

(Continued on Advertising Page 46)

INFORMATION

THE PHYSICIAN AND MEDICAL-LEGAL PHASES IN THE ADOPTION OF CHILDREN*

DONALD G. TOLLEFSON, M.D., *Los Angeles*

The placing of a newborn infant in the hands of foster parents bears a great legal as well as moral responsibility. Physicians should be thoroughly conversant with the laws of the State of California which require that relinquishing of any child for adoption must be handled by a licensed agency, or through the State Department of Social Welfare. The interests of the real parent, the foster parent and, above all, the child are entitled to protection which this method provides.

The importance of the whole problem of adoption has been brought to the attention of the medical, legal and social welfare professions and a committee has been studying this problem for the past year. Certain facts will emphasize the need for such a study. Locally as well as nationally there exists what is popularly known as a "black market" in babies. Unscrupulous doctors, lawyers, and other greedy individuals have taken newborn infants away from their mothers and placed them with some young couple unable to have a child of their own, the couple paying the so-called expenses in order to obtain the baby. Many girls finding that they are pregnant will accept readily any suggestion which will take from them the responsibility for the baby's care as well as their own. Probably two-thirds of the babies for adoption are from these mothers. The number has increased in astounding proportions during these war years. Licensing of child placement agencies is required in 30 states, including California. (This was done by Congress for the District of Columbia by passing the so-called "Baby Broker's Bill.")

The demand always exceeds the supply of babies. Therefore, it is not surprising to find 5,132 petitions were filed by foster parents in California last year and over 5,000 applications are on file with the two approved agencies to adopt infants.

Last year, 917 children were relinquished to the licensed agencies for these 5,000 petitioners. In addition, 2,931 independent adoptions were filed and were investigated by the State Department of Social Welfare. The proper method of procedure for doctors is to refer the baby as well as prospective foster parents to the licensed agencies, which after accepting the relinquishment of the child are able to study the particular infant and select a home best suited to his needs. The problem is, therefore, to increase the facilities for the handling of adoptions by expansion of the present licensed agencies by increased financial support through donations, direct grants or subsidies by the state, and by increasing the number of such agencies under either private or public auspices.

The small number cared for by the present agencies has caused many physicians and lawyers, who are the contacts with prospective petitioners, to make private placements which lead to independent adoptions. Doctors are besieged by patients who cannot have children by reason of sterility. An unwed mother comes to the doc-

tor—she may come from a neighboring city, possibly from one of the doctor's colleagues. He is asked to care for her at a reduced fee and he knows of a couple wanting a baby. He explains to the expectant mother that he will see that the baby is cared for, and as soon as the baby is born all she has to do is to release the baby to some second person, thus relieving her of responsibility and assuring that her identity will be concealed. This is the first mistake. Hospitals must notify the State Department of Social Welfare when a baby is released to any person other than the parent, and a representative of the State Department must be present when the mother signs the consent to the adoption. The necessary investigation of either the child or the home is made after the placement. The best interest of the infant may not be served in that particular environment. Since the placement preceded adequate knowledge of the child and home, the child's welfare is not properly safeguarded.

Once the child is placed in the home, what if the child's development results in some unforeseen abnormality? What if he or she is a mental defective? What if serious health or other problems of the adoptive parents appear? It would be far better to have a period during which the child and the adoptive parents are observed, and during which petitioners and the child can be matched as to religion, nationality and cultural background. Again, what chances the foster parents take when the unwed mother may see on the paper she signs the name of the petitioners and their address! She may not look, but it is a possibility. Also, what about the doctor if this unwed mother comes back and says, "Doctor, where is my baby?" Or, "I made a mistake; I want my baby back!"

This is the problem in which you are vitally involved. Knowing the dangers to everyone concerned, you can avoid making irregular placements.

Laws of various other states are being studied as well as present California statutes, in order to make such changes as will protect all persons concerned in adoptions. Our duties to the unwed mother and to her child, as well as to our eager patients who want an adopted child, should be governed by the experience of our State Department of Social Welfare.

1. An unwed mother should be referred to a social agency as soon as she comes under the physician's care.

2. Petitioners desirous of obtaining a child by adoption should be referred to a licensed agency of the State Department of Social Welfare.

3. Do not take the responsibility of an independent adoption placement.

4. Do not deliver a baby and make arrangements with a third person to pay the bill with the guarantee that the baby can be adopted.

5. Obey the law and encourage any legislation or campaign to make available care for more infants during the period when they may be observed or studied.

511 South Bonnie Brae.

* Read before the Second General Meeting at the Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

Letters to the Editor . . .

MILK-BORNE CARCINOGENIC VIRUS

In 1936 it was shown by Bittner¹ that the apparently spontaneous mammary cancer in certain strains of mice is due to an "influence" or "incitor," transferred by nursing from the mother to the new-born young. Young born of the carcinophilic strain and foster-fed by mothers free from this apparently hereditary taint seldom if ever develop spontaneous breast cancer in late life. Young born from cancer-free strains and foster-fed by carcinophilic mothers often developed lethal breast cancer. It was afterwards shown that the same "incitor" may be demonstrated in either spontaneous or transplanted mammary cancer of mice² or in apparently normal lactating mammary tissues³ of certain strains.

The active agent is present in cell-free filtrates from mammary carcinoma.⁴ Tests were made on 4 or 5 week old females which had parents that did not transfer the influence in their milk but which had the inherited susceptibility for spontaneous mammary cancer. These young mice were inoculated intraperitoneally with Berkefeld filtrates from carcinoma tissues. In a typical group of 10 mice inoculated with such filtrates, 8 died and in a second group of 22 mice similarly inoculated, 12 died of spontaneous mammary cancer by the end of 12 months. The incidence of mammary cancer in several hundred uninoculated controls was less than 1 per cent.

These data suggest that the carcinogenic "influence" is a filtrable virus. If so, the "influence" presumably multiplies or is multiplied in symbiosis with mammary tissues. To test this possibility, 10 serial transplants of carcinoma tissue were made in mice that did not themselves carry the active milk agent. Berkefeld filtrates from the 10th serial passage caused the development of lethal mammary cancer in 8 out of 12 injected mice. There is thus evidence of the continuous production of the active agent within the transplanted tumor cells. Attempts to propagate the "influence" in embryonated hens eggs, thus far have not been very convincing, even though the milk agent survives for 12 days in the yolk sac in the absence of living mouse cells.

In order to obtain further evidence in support of the virus theory, Green⁵ and his associates of the University of Minnesota studied the antigenic properties of the mouse-tumor agent. To do this, high-speed centrifugates from mouse mammary carcinoma filtrates were repeatedly injected into rabbits and white rats, both spontaneous mammary tumors and transplant tumors being used in making the filtrates. Control injections were made with filtrates from normal mouse tissues. Seven to ten days after the 5th injection serums were drawn from the injected animals, and tested for their possible virucidal action on the mouse-tumor agent.

To do this, centrifugate equivalents of 0.2 g. tumor tissue were suspended in 0.5 cc. saline solution and mixed with 0.18 cc. antiserum. After 2 hours standing at room temperature, 24 4-week old mice were injected with each mixture. Of 48 control mice injected with virus alone or with a mixture of virus and an antiserum against normal mouse tissues, 39 or 80 per cent developed breast tumors by the end of 13.5 months. Of 48 mice injected with a mixture of virus and specific antiserum (anti-milk "influence"), not a single case of breast tumor developed during the same period of time.

These findings confirm the earlier hypothesis that the milk agent is of exogenous origin. Whether or not the specific virucidal antiserum would be therapeutically

effective in mice already infected with the milk-borne virus has not yet been tested.

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PROTEIN-REPLETION THERAPY

In 1942 it was shown by Cannon¹ of the Department of Pathology, University of Chicago, that antibody formation is largely a function of protein reserves. Rabbits whose protein reserves had been reduced by plasmapheresis or prolonged low protein diets usually produced agglutinins of but one-fifth the titer of agglutinins produced by well-fed controls.

His implied theory of acquired immunity was of particular interest at that time due to its application to the epidemiology of infectious diseases under wartime conditions. Cannon² subsequently found that there is a positive correlation between protein deficiency and surgical infection. It therefore became of practical clinical interest to determine how promptly and effectively protein depletion can be corrected by dietary measures.

To test this³ groups of adult white rats were placed on a protein depletion diet. The diet usually contained less than 2 per cent protein, with compensatory increases in non-protein factors so as not to reduce caloric intake. Vitamin intake was left constant. By the end of 83 to 191 days, there was 30 to 40 g. loss of body weight, and a 30 per cent reduction in hemoglobin and serum proteins. These depleted rats were then injected in the tail vein with washed sheep erythrocytes. They produced antisera averaging 560 hemolytic units per cc. by the end of 6 days. As controls, normally fed rats were similarly injected. They produced antisera averaging 560 hemolytic units per cc. by the end of 6 days. As controls, normally fed rats were similarly injected. They produced antisera with an average hemolytic titer of about 8000 units per cc. by the end of the same period, or 14 times the antibody titer of the depleted rats.

Protein-repletion tests were now made on other groups of depleted rats. To do this dehydrated beef, lactalbumin or proteinhydrolysate ("amigen") were added to the depletion diets in such a way as to increase the protein (or its equivalent) to about 20 per cent. There was practically no change in daily vitamins or caloric intake. Animals on these repletion diets made satisfactory weight recoveries (35-50 g. per rat) and serum protein regeneration (2.05 to 2.96 g. per cent) by the end of 7 days. During this 7-day recovery period, injection of washed sheep erythrocytes led to the production of antisera of an average hemolytic titer of 3830 units per cc. by the end of 6 days. This was nearly 7 times the average titer in depleted rats. A 2.6-fold improvement was seen after only 2 days protein-repletion feeding, increasing to

nearly a 10-fold increase by the end of 7 days therapeutic feeding.

Depression of specific antibody function by protein depletion is therefore reversible. Feeding with high-quality protein or its equivalent will therefore restore within about 7 days a depleted animal's ability to produce antibodies of relatively normal titer. These findings suggest that it is not only important in a rehabilitation program to feed severely undernourished persons rations high in calories and vitamins, but also rations containing an adequate amount of high-quality proteins or their equivalent, particularly when bacterial infection is present or impending.

The exact mechanism whereby protein depletion de-

presses specific antibody production and protein repletion re-establishes it is still undetermined.

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BOOK REVIEWS

A BIBLIOGRAPHY OF INFANTILE PARALYSIS WITH SELECTED ABSTRACTS AND ANNOTATIONS—1789-1944. Prepared under direction of the National Foundation for Infantile Paralysis, Inc. Edited by Morris Fishbein, M.D., Editor, *Journal of the American Medical Association*; compiled by Ludvig Hektoen, M.D., Chief Editor, *Archives of Pathology* and Ella M. Salmonsens, Medical Reference Librarian, John Crerar Library, Chicago. Cloth. Pp. 672. Philadelphia, London, Montreal: J. B. Lippincott Company, 1946.

The last comprehensive survey of the literature on poliomyelitis was that of the Milbank International Committee published in 1932. During the 14 years that have since elapsed the many workers in that field have increasingly felt the need of another and more complete bibliography. The Milbank report consisted of a series of reviews of various phases of the subject and its bibliography contained only 830 of the more than 5,000 items which the present volume shows had been published up to that time. The latter contains over 8,400 references for the period ending with 1944, a striking witness to the tremendous interest which poliomyelitis has attracted in the medical profession and its ancillary services.

The arrangement of the present volume is admirable. The articles are consecutively numbered and listed by year, those within each year being given alphabetically. At the end of the volume is an index of authors followed by a subject index. The latter, while occupying 94 pages and extraordinarily detailed, is not absolutely complete. The important study of Rissler, for example, in which the first detailed histopathological study of acute poliomyelitis was presented, is not listed under Pathologic anatomy nor under Pathology, probably because of its un-descriptive title. An occasional omission of this sort is, of course, humanly unavoidable. Brief but usually adequate abstracts of papers of more than ordinary interest are given.

Of special interest to Californians is the fact that the first case report from this state (of a patient from Eureka) appeared in 1874-75 in the *Pacific Medical and Surgical Journal* under the name of G. M. Kober. The first recorded epidemic here, that of 1901 consisting of 55 known cases, was reported by Alice M. Woods in 1903 in the *Occident Medical Times*. The epidemic of 1910 was still larger, necessitating the appointment of a committee for the Study of Anterior Poliomyelitis in San Francisco under the chairmanship of the late E. C. Fleischner; its report in the *California State Medical Journal* was published in 1911 and recorded 139 or more cases. It was not until this time or shortly thereafter that the disease was officially listed and systematically reported in public health reports. For this state as elsewhere it is impossible to obtain an accurate estimate of

the prevalence of poliomyelitis in the nineteenth and early part of the twentieth century because reporting was casual and haphazard and the disease was classified with meningitis and other infections of the central nervous system. But the bibliography clearly indicates that the disease which during the last four decades has occurred in such large epidemics in the temperate zones began with sporadic cases and small outbreaks and took more than a century to reach its recent proportions.

The reviewer has not time nor space to discuss the many other interesting facts disclosed by the present volume, such as the development of our present knowledge of the pathology, epidemiology, clinical aspects, experimental research, and therapy, but they are covered with gratifying completeness and ease of reference. The medical world is deeply indebted to the National Foundation for Infantile Paralysis and to the labors of the editors of the bibliography for a notable addition to its armamentarium. Special commendation is due for the handsome format and conspicuously legible typeface of the volume.

PHYSICAL CHEMISTRY OF CELLS AND TISSUES.

By Rudolf Hober, University of Pennsylvania School of Medicine, Philadelphia, Pa.; with the collaboration of David I. Hitchcock, Yale University School of Medicine, Laboratory of Physiology, New Haven, Conn.; J. B. Bateman, Mayo Clinic, Rochester, Minn.; David R. Goddard, University of Rochester, Biological Laboratories, Rochester, N. Y., and Wallace O. Fenn, University of Rochester, School of Medicine and Dentistry, Rochester, N. Y. Cloth. Price, \$9.00. Pp. 676, illustrated. Philadelphia: The Blakiston Company, 1945.

As the title indicates, this book is for the experimental investigator of fundamentals of biological function, chiefly cells, including living and non-living models. This approach has been of unquestionable value in shedding light on the physico-chemical nature of living function, but the reader may sometimes wonder whether the devotees of this approach are making physiology the handmaid of physics and chemistry, for their sake, or whether the nature of living function is being explained in and for itself. Woodger has pointed out the serious limitation to, if not fallacy of, attempting to account for biological phenomena according to laws of physics and chemistry, and he gives many examples in his own book where these inanimate sciences fail conspicuously to elucidate striking and common every day phenomena. It would seem there is something "vital" (perhaps a poor term) or peculiar to the behavior of living tissues which must be taken into account for a better understanding of function than merely physics and chemistry. For instance, selectivity,

reflex actions, especially the protective or purposive kind, sensitization and a host of other biological reactions cannot as yet be explained on a strictly physical-chemical basis. Since the structure of protoplasm is not fully understood, it must be difficult to apply the laws of physics and chemistry for a better understanding of it. Of course, the authors of this book do not claim to have the key to the mysteries of the living cell, but they have certainly done their best in applying mathematics and the laws of physical chemistry to get the better understanding. Without a good grounding in these precision sciences the material in this book cannot be comprehended and therefore it will be of no interest to physicians in general.

For students of medical and biological sciences, however, a deeper though generally limited insight may be obtained into the following subjects considered in the book: cell surface activity, permeability, cellular and tissue respiration, respiratory enzymes, fermentation, contractility of skeletal muscle, intestinal absorption, urine formation, elaboration of digestive juices, and transfer mechanisms for ions, water, etc. The senior author and his four collaborators are well known specialists in the physico-chemical basis of living phenomena and have given the expert treatment to the subjects considered. This book should be thought provoking and stimulating to investigators of fundamentals in biology and medicine.

DISEASES OF THE SKIN FOR PRACTITIONERS AND STUDENTS. By George Clinton Andrews, A.B., M.D., Associate Clinical Professor of Dermatology, the College of Physicians and Surgeons, Columbia University; Chief of Clinic, Department of Dermatology, Vanderbilt Clinic; Chief of Dermatology Clinic, Roosevelt Hospital; Attending Dermatologist to Presbyterian Hospital and Roosevelt Hospital; Consulting Dermatologist and Syphilologist to Tarrytown Hospital, Grasslands Hospital, Valhalla, St. Johns Hospital, Yonkers, Greenwich Hospital and the Beekman-Downtown Hospital; Fellow of the American Medical Association, of the American College of Physicians, and the New York Academy of Medicine; Member of the American Dermatological Association, the American Radium Society, the New York Dermatological Society, New York Roentgen Society, and the Manhattan Dermatological Society; Member of the Deutsche Dermatologische Gesellschaft and Corresponding Member of the Société Française de Dermatologie et de Syphiligraphie. Third edition with 971 illustrations. Cloth. Philadelphia and London: W. B. Saunders Company, 1946.

The third addition of Dr. Andrews' text on Diseases of the Skin is most timely and welcome. It covers completely the common and rare forms of skin disorders as well as all venereal diseases except gonorrhea. Many new skin diseases have been added.

The chapters on superficial x-ray therapy and radium therapy are enlarged and brought up to date. The section on tropical skin diseases is concise, well written and important to all who see patients, who have contracted diseases in the South Pacific. The discussion of the various allergic dermatoses is comprehensive and well done and does not occur in other texts of dermatology. The chapter on fungus diseases has been entirely rewritten and modernized. Dermatological therapy has been completely revised and modernized. Excellent formulas are given for the treatment of all the various skin diseases.

Syphilis is covered well and the new methods of rapid treatment of early syphilis and the use of penicillin in syphilis is discussed. Chancroid, lymphopathia venereum, granuloma inguinal are concisely covered.

Another addition which makes this book more valuable is the inclusion of references at the end of each chapter.

The only criticism offered here is that Dr. Andrews has omitted from this edition the use of thallium acetate for epilation of children with tinea capitis due to micro-

sporon audouini and the omission of curette and fulguration or cautery of superficial epitheliomas of the skin. Both of these methods are used frequently in many teaching university hospitals and certainly deserve a place in any book on skin diseases.

The great amount of information in the text, together with the excellent black and white photographic illustrations, bibliography and concise manner of presentation, makes this a most valuable book for students and practitioners of dermatology and syphilology. It is one of the best books on this subject to date.

NARCOTICS AND DRUG ADDICTION. By Erich Hesse, M.D. Cloth. Price, \$3.75. Pp. 219. New York: The Philosophical Library, 1946.

The author places addicting drugs in two groups, the narcotics, and the stimulants. The former are defined as being truly dangerous, the latter, as relatively harmless, but they are alike in producing a subjective feeling of well-being which makes it possible to "forget the troubles of the world for a while." Among the narcotics are opium, coca, mescaline, hemp, and kava-kava; among the stimulants are alcohol, tobacco, the purines, and betal. Each is considered briefly, from the standpoint of history, chemistry, pharmacology, and social significance.

The book is a strange mixture of dogma and science. The author feels that the use of any of these drugs is wicked, but that as mankind refuses to be entirely good, habituation must be accepted, and efforts directed toward replacing the use of narcotics with the reasonable use of the stimulants.

The book is a translation from the German, and appears to be literal to the point of ineptness, and to have been made by a non-medical person.

AUTOPSY DIAGNOSIS AND TECHNIQUE. By Otto Saphir, M.D., Pathologist, Michael Reese Hospital; Professor of Pathology, University of Illinois Medical School, Chicago. Foreword by Ludvig Hektoen, M.D. Second edition, revised and enlarged. Leather. Pp. 405, illustrated. New York, London: Paul B. Hoeber, Inc., Medical Book Department of Harper and Brothers, 1946.

This manual presents in detail a modified Rokitsky method for the performance of post mortem examinations. The technique is clearly stated and well illustrated. For each step of the examination the text supplies adequate descriptions of the gross anatomic findings most commonly encountered and provides numerous tables of differential diagnosis based on these appearances. By limiting the presentation to that of a single method confusion is avoided, and the inexperienced or occasional prospector is assured of performing a complete examination if he intelligently follows the ample instructions.

The book is particularly valuable for those beginning or resuming the study of autopsy technique as medical students, interns, residents or practicing physicians performing an occasional examination. It is a guide and handbook. It is not intended as a textbook of pathology nor does it offer the special techniques employed by experts in the unusual case as, for instance, in certain medico-legal problems. The sole emphasis is upon gross morbid appearances with perhaps insufficient directions for the preservation of specimens for toxicologic, bacteriologic or serologic investigation.

This second edition is enlarged by sixty pages representing the addition of several new chapters (the Nose and its Accessory Sinuses, Autopsies on Stillborns and Infants, Anatomic Findings in Vitamin Deficiencies, and Notes on Certain Tropical Diseases); and by the expansion of several of the former sections notably those on accidental deaths and on the examination of the breast.

COSMETICS AND DERMATITIS. By Louis Schwartz, M.D., Medical Director, U. S. Public Health Service; Chief, Dermatoses Section, Division of Industrial Hygiene; Adjunct Professor in Dermatology, Georgetown University School of Medicine; Associate Clinical Professor in Dermatology and Syphilology, New York University College of Medicine; Consultant, Office of Price Administration, and Samuel M. Peck, M.D., Medical Director (R), U. S. Public Health Service; Associate Attending Dermatologist, Mt. Sinai Hospital, New York City; Attending Dermatologist and Syphilologist, Skin and Cancer Unit of the New York Postgraduate Medical School and Hospital of Columbia University; Diplomate of the American Board of Dermatology and Syphilology. Cloth. Price, \$4.00. Pp. 189. New York, London: Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, 1946.

The authors are competent authorities to discuss the subject covered by this book. The word, "cosmetics" is used by them rather broadly, including soaps and dentifrices, and there is little to criticize so far as statement of facts is concerned.

One wonders, however, to whom this book would be of particular interest. Certainly to the dermatologist worthy of the name there is nothing new, and reporting new chemicals as allergens is of comparatively little value since every case presenting itself offers a detective problem no matter how conversant the specialist is with the whole subject of cosmetics. For the general practitioner the problem is largely one of differential diagnosis and much of this he could long ago have gathered from textbooks on dermatology. If he will get really interested in this subject the book may prove of some value to him. The intelligent public has long been familiar with the problem of allergy in a confused manner and it is questionable whether the book will be of much further help to it. Surely the manufacturer has long had to face the problem, including the chemist particularly interested in the manufacture of these preparations.

Possibly all of these various groups may get a little enlightenment from this book, and in that sense coming from the Public Health Service it may fill a want. It is difficult for the reviewer to wax enthusiastic over a book of this type.

PREOPERATIVE AND POSTOPERATIVE TREATMENT. Edited by Lt. Col. Robert L. Mason, M.C., A.U.S., Cushing General Hospital, Framingham, Massachusetts, and Harold A. Zintel, M. D., Harrison Depart-

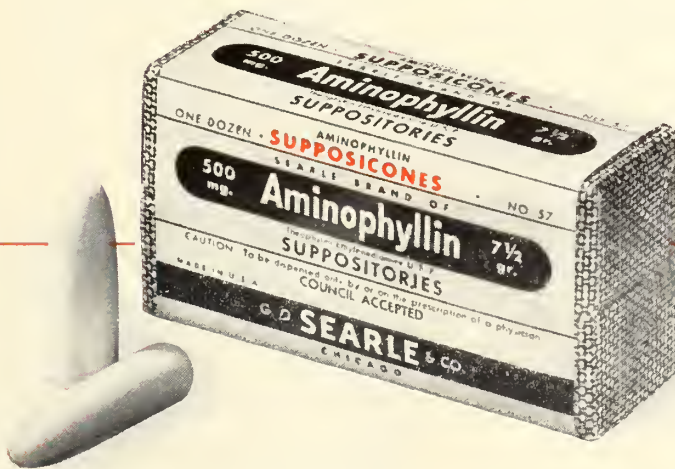
ment of Surgical Research, University of Pennsylvania School of Medicine; Assistant Surgeon, Hospital of the University of Pennsylvania. Second edition, illustrated. Cloth. Pp. 584. Philadelphia and London: W. B. Saunders Company, 1946.

This book is a revision of the 1937 edition. Mason, Zintel, and their collaborators have done an excellent piece of work and this edition brings it up to date. The book is divided into two parts. The first part covers general considerations of pre- and post-operative management; the second part applies these principles to regional surgery and describes the surgical treatment of regional conditions as well. The first few chapters are devoted to preoperative considerations and the evaluation of the various factors which influence the operative risk. They discuss the conditions which require special therapy and outline their management. The chapters on water balance, acidosis and alkalosis are particularly well done and the reader is given a practical outline of their management both preoperatively and postoperatively. In general, not only the diagnosis, care, and management of everyday problems but the unusual complications as well are covered. The importance of many of the little things which we are likely to overlook in the care of the patient are stressed together with the more obvious considerations. The second part deals with the surgical treatment of regional conditions in an excellent manner. Physiology is considered from a wholly practical standpoint as a basis for therapy. Indications and contraindications for various surgical procedures are discussed and postoperative care is outlined in detail. The best current opinion is liberally interspersed with the author's views in a manner which gives the reader a broad view of the points under discussion. The information on penicillin and thiouracil is not quite up to date but in view of the changing picture in regard to these products the information contained in this book is sound. The book is easy to read and to use as a reference work. It is well indexed and there is an extensive bibliography. An appendix of findings in the blood and urine in health and disease constitutes a valuable source of quick reference and information. All surgeons should have the book in their libraries and individuals who are preparing for a surgical specialty should find it invaluable.



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EMILE HOLMAN, M.D.,
Consultant in Thoracic Surgery,
Stanford Hospital,
San Francisco, California.

MEDICAL JURISPRUDENCE

HARTLEY F. PEART, ESQ.
San Francisco

Malpractice: Sufficiency of Evidence: Degree of Skill Required of a Surgeon

A case decided by the California Supreme Court involving the degree of skill and care necessary for a surgeon to exercise may be of interest to members of the medical profession. In an appellate court decision a few years ago, it was held that a physician or a surgeon is not liable for every result which may occur in medical practice but is required only to exercise the degree of learning and skill ordinarily possessed by physicians of good standing practicing in the same locality and to use ordinary care and diligence in applying that learning and skill to the treatment of his patients.

The plaintiff, Mr. E. sued Dr. C. for damages alleged to have been sustained as the result of negligence in the performance of an operation. The facts were as follows: Dr. C. with the assistance of Dr. R. operated upon Mr. E. for the purpose of correcting an instability of the left knee. The operative work consisted of the repair of the exterior lateral and posterior crucial ligaments which had been torn and ruptured as the result of a fall. The operation involved the removal of the damaged portions of the ligaments and the substitution therefor of new material obtained by cutting sections from the fascia lata and the biceps muscle of the left leg. It was performed while Mr. E. was unconscious.

After the operation, Mr. E. began to suffer from an inability to control the lifting and side-wise movement of the left foot and also from numbness in an extensive area of the lower left leg. Upon examination by another physician, it was found that the external peroneal nerve in that leg was severed in the vicinity of the knee.

When called as a witness, Dr. C. testified concerning what was done by him and Dr. R. and the procedure ordinarily employed by surgeons performing an operation of the kind submitted to by Mr. E. Dr. C. testified that "although the peroneal nerve can be isolated, it is not the practice to do so in operations of this kind. Accordingly, after the necessary incision was made and the cutting progressed through the skin, the fascia, and other structures down to the bone, the surrounding muscles and tissues were drawn aside and held back by blunt retractors which were adjusted and maintained in position by Dr. R." During the entire operation, Dr. C. handled all the sharp instruments; Dr. R. did nothing except to hold the retractors.

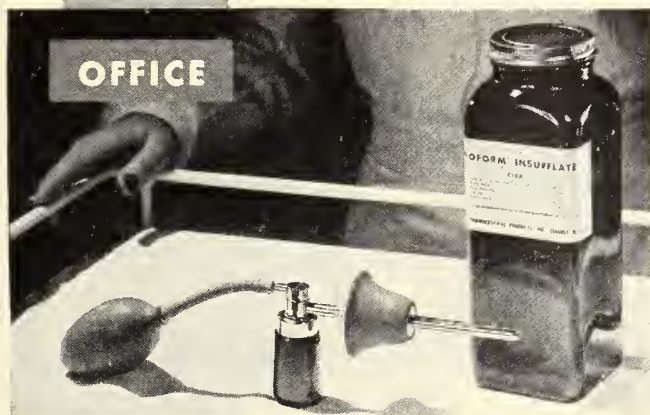
After the operation was completed, a check was made to see whether the nerve was cut. This was done by looking at the tissues which had been dissected and all of them were identified. Dr. C. testified that the nerve was not sutured because, in his opinion, that was not required. When Dr. C. was asked if "you could state positively that neither you nor Dr. R. severed this nerve," Dr. C. replied that he could not say, "although he did not do any cutting" in the neighborhood of it. "The severance of this nerve is a problem that is one of the difficulties of surgery." Continuing, Dr. C. stated that "although it does not ordinarily happen, it is something which may occur. The nerve can be injured by pulling on a blunt instrument alone and the problem as to whether or not that was true was our first problem after the operation."

The evidence revealed that Dr. C. testified to the effect that although the peroneal nerve is not difficult to locate and identify, a surgeon can miss it and thereby cause injury. Dr. C.'s testimony in this respect was corroborated

(Continued on Page 38)

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MEDICAL JURISPRUDENCE

(Continued from Page 34)

by two well qualified surgeons who were called as witnesses in his behalf. Each of these witnesses stated that it was standard technique to leave the nerve covered in its protective tissue rather than to expose it, because exposure is more likely to cause injury; to retract the nerve without tissues is the most conservative method.

The trial court granted a non-suit as to defendant Dr. R. and after hearing the evidence presented by the defendant, Dr. C., directed a verdict in his favor. The California Supreme Court affirmed each of these judgments.

In its opinion, the Court stated that the medical testimony revealed without contradiction that although the severance of the peroneal nerve is something which ordi-

narily does not occur in operations such as that performed by Dr. C., yet even when the precautions prescribed by the approved technique are taken, there is a break of or injury to the nerve in from 5 per cent to 8 per cent of the cases. The Court continued, stating that such evidence affords no basis for the recovery of damages against a surgeon. Further, that "probably in every operation there is some hazard which the medical profession recognizes and guards against, but which is not always overcome."

Then the California Supreme Court stated that the law has never held a physician or surgeon liable for every result which may occur in medical practice, and requires only that he shall have the degree of learning and skill ordinarily possessed by physicians of good standing practicing in the same locality and that he shall

(Continued on Page 40)

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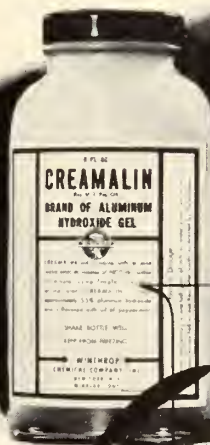
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MEDICAL JURISPRUDENCE

(Continued from Page 38)

use ordinary care and diligence in applying that learning and skill to the treatment of his patient. In following this general rule, the Court held that negligence on the part of a physician or surgeon will not be presumed; it must be affirmatively proved. In the absence of expert evidence, it will be presumed that a physician or surgeon exercised the ordinary care and skill required of him in treating his patient. The Court held that the evidence in the instant case established beyond question not only that the peroneal nerve may be injured even where due care is used, "but that this unfortunate result invariably occurs in a limited number of cases," and it held therefore that no malpractice had been proved.

CHANGES IN MEMBERSHIP

(Continued from Advertising Section, Page 28)

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Bierman, Jessie M., *San Mateo County*

Board Proceedings

By **FREDERICK N. SCATENA, M.D.**
Secretary-Treasurer

Proceedings of the Board of Medical Examiners of the State of California

A regular meeting of the Board of Medical Examiners was held at the Native Sons Hall, in San Francisco, from June 10 to 13, 1946.

Written examinations were conducted and hearings were held on petitions for restoration of revoked certificates, as well as disciplinary matters.

The following changes were made in the status of licentiates after a regular hearing:

Gilbert M. Barrett, M.D. The probationary period of Dr. Barrett was terminated on June 10, 1946.

Rexford William McBride, M.D., was found guilty of violation of Section 2383 of the Business and Professions Code on June 13, 1946, and was reprimanded.

Dorothy Hope Kemp, M.D., was found guilty of violation of Sections 2383 and 2391 of the Business and Professions Code on June 12, 1946, and was placed on probation for a period of five years, without narcotic privileges or possession.

A writ of mandate, issued by Judge Sylvain Lazarus of the San Francisco Superior Court, directing the Board of Medical Examiners to admit to written examination

(Continued on Page 44)



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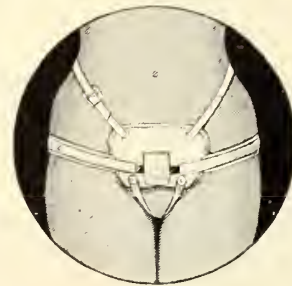
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BOARD OF MEDICAL EXAMINERS

(Continued from Page 40)

Dr. Zelwyn A. Aarons, a graduate of a non-approved school, after the Board had denied his application, was arrested by a writ of supersedeas issued by the State Court of Appeals.

News

"Chiropractor Can't Use Insignia—Attorney General Robert W. Kenny ruled today that a chiropractor is not entitled to use the physician's insignia on his automobile as a recognition device which doctors use when answering emergency calls. . . . 'The great weight of authority is that the term "physicians" excludes chiropractors,' the attorney general stated. . . . The opinion was requested by Philip E. Davis, deputy director, Department of Motor Vehicles." (Pasadena, Calif. *Star-News*, June 1, 1946.)

"Hoyt Quits Effort to Appeal Case—Walter C. Hoyt, former Gridley doctor, has abandoned his appeal taken against the decision of a jury that found him guilty May 9, in Superior Court on a charge of committing an abortion. . . . Hoyt also gave up his appeal to the higher court against Judge Deirup's denial of a new trial. King and Savage, attorneys for Hoyt issued the announcement of the abandonment of appeal. Hoyt is in San Quentin prison, sentenced to serve from two to five years there." (Oroville, Calif. *Mercury*, May 29, 1946.)



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* Cahill, W. M., Schroeder, L. J. and Smith, A. H. Digestibility and biological value of soybean protein in whole soybeans, soybean flour, and soybean milk, J. Nutrition, 28:209, Sept. 1944.

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NEWS AND NOTES

(Continued from Text Page 87)

"as part of the Army Medical Department's program to maintain the highest possible standards of medical practice." As consultants, the appointees will be expected "to evaluate, promote and improve wherever possible the quality of medical care given the American soldier."

The American College of Physicians will hold its 28th annual session in Chicago, April 28-May 2, 1947, according to E. R. Loveland, executive secretary, who makes early announcement of the meeting because "medical societies and physicians appreciate knowing long in advance the dates of important national medical meetings" in order to avoid conflicting dates. Address of the College is 4200 Pine Street, Philadelphia 4.

Voluntary medical and hospitalization plan coverage of about 80 per cent of all employees of the oil industry in California is indicated by a survey recently conducted by Oil Producers Agency. Companies reporting medical and hospitalization plans in force account for between 80 and 90 per cent of all employment in the industry, and those companies reporting no such programs have relatively few employees. Of the plans reported, all provided for hospitalization, about 88 per cent for employee surgery within limits varying with the type and cost of the plan, and approximately 35 per cent cover routine medical care for employees. About 50 per cent make provision for some degree of medical, hospital and surgical services for members of employees' families, although there is wide variation in type and amount of such coverage.

An Assembly committee on health insurance of the California legislature has recommended that the state provide medical care facilities for all who need them,

with a system of free clinics staffed by doctors on state salaries where medical care is inadequate. The committee did not, however, make any recommendation regarding compulsory public health insurance.

Finding that medical facilities in the state "are below the level which must obtain if the people are to have adequate care," the Assembly group recommended:

1. That the State Department of Public Health sponsor conferences of doctors, insurance companies and legislators to recommend improvements in health services to the legislature.

2. State responsibility for maternity care of women and medical care for children up to two years of age.

Among other findings of the committee were that compulsory health insurance as proposed in bills before the 1945 legislature cannot be financed on a 3 per cent payroll tax without modification of the plan. It reported also that although a survey made for the committee indicated 76 per cent of the people of the state were opposed to compulsory health insurance, just over half believe the state should set up a voluntary system to compete with insurance companies.

The State Board of Medical Examiners of California will add three inspectors to its staff to take care of an increasing number of complaints and applications for licenses to practice medicine in the state, according to Fred Taylor, assistant director of professional and vocational standards. Applications by physicians for licenses totaled 1,529 in the first six months of 1946, comparing with 1,220 during the entire year 1945, Mr. Taylor said.

Operative surgical clinics in 17 Detroit hospitals will be featured the first morning of the Eleventh Assembly of the United States Chapter, International College of Surgeons, to be held in Detroit, October 21-22-23.

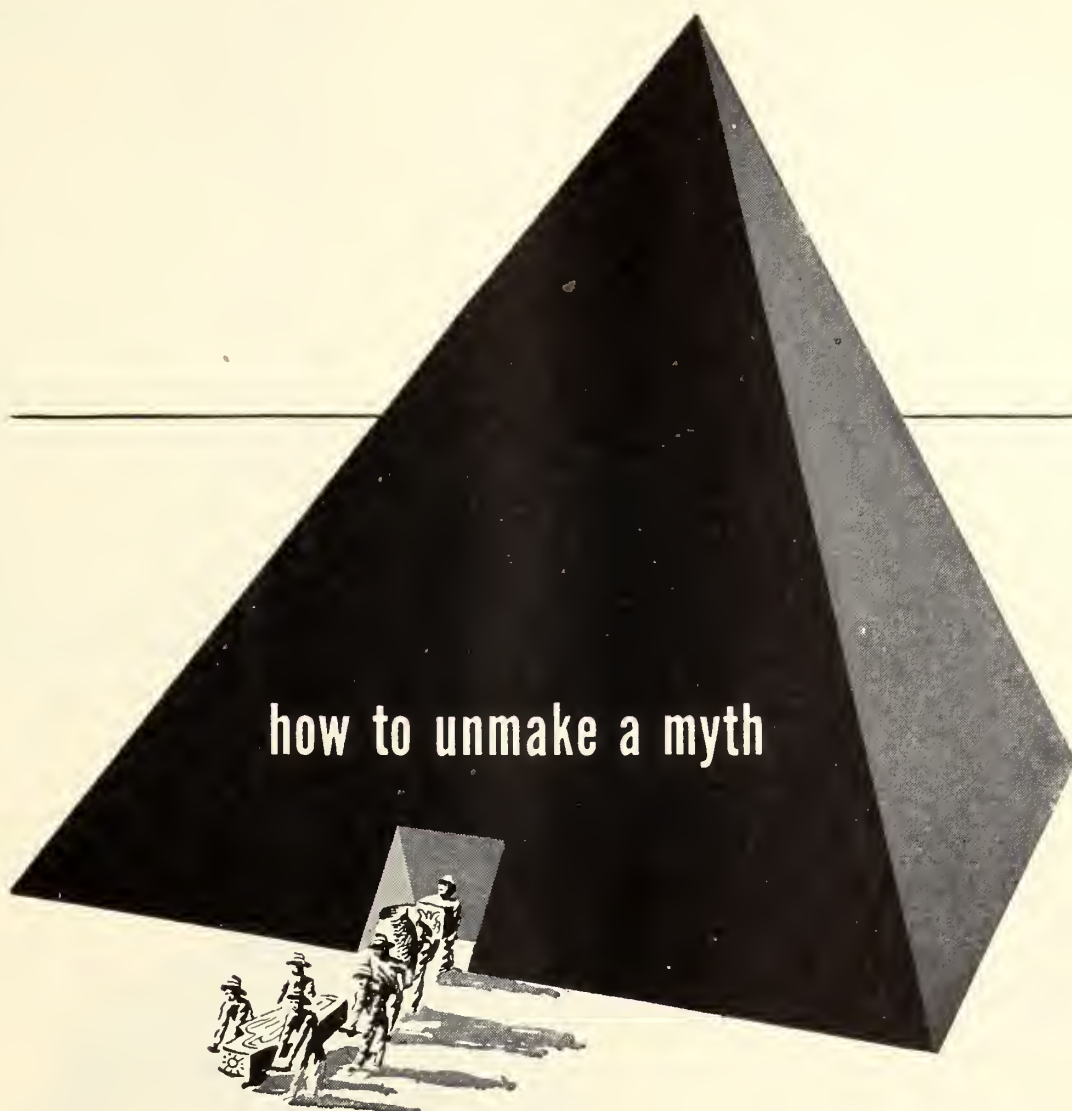
(Continued on Page 48)

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1. Am. J. Dis. Child. 66:1 (July) 1943



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NEWS AND NOTES

(Continued from Page 46)

Special arrangements have been made to demonstrate the advances in gastric, thoracic, biliary, intestinal, genito-urinary, and plastic surgery. The various specialties, such as, ophthalmology, otolaryngology, and gynecology, the modern treatment of burns, fractures, and modern uses of wire in surgery will be featured.

During the remainder of the three-day Assembly, 32 internationally known speakers will deliver 20-minute surgical talks in Detroit's Masonic Temple.

For information concerning the Detroit Assembly or the primary qualifications for Fellowship in the United States Chapter, International College of Surgeons, write

Secretary L. J. Gariepy, M.D., 16401 Grand River Avenue, Detroit 27, Michigan.

Any patient with a bona fide Addisonian pernicious anemia may receive, without charge, a gastroscopic examination of his stomach as well as a gastrointestinal x-ray series. Funds to finance the service were granted by the International Cancer Research Foundation.

This work is based on the belief that gastric tumors both benign and malignant, develop with undue frequency in those with pernicious anemia.

Any physician desiring to utilize this service should write to the Director of the Out-Patient Department, University of California Hospital. Instructions and an appointment will be sent. Data always should be included which demonstrate the unequivocal diagnosis of pernicious anemia. A report will be made to the referring doctor.

(Continued on Page 52)

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NEWS AND NOTES

(Continued from Page 48)

The American Congress of Physical Medicine will hold its twenty-fourth annual scientific and clinical session September 4, 5, 6 and 7, inclusive, at the Hotel Pennsylvania in New York. Scientific and clinical sessions will be given each day. The annual instruction courses will be held September 4, 5, and 6, open to physicians and to therapists registered with the American Registry of Physical Therapy Technicians.

For information concerning the convention and the instruction course, address the American Congress of Physical Medicine, 30 North Michigan Avenue, Chicago 2, Illinois.

Stanford University has received a grant from Winthrop Chemical Company, Inc., for a fellowship in Pharmacology which will run through the calendar years 1946 and 1947. The Stanford grant is one of many totaling \$92,500 which the company has made for special medical research projects.

Dr. Monroe Eaton, director of the Virus Laboratory of the State Department of Public Health, has been named to the editorial committee of the Annual Review of Microbiology, to be published by Annual Reviews, Inc., Stanford University. The review will cover the general field of microbiology—Medical, agricultural and industrial—and various special fields such as the virus diseases, the physiology of bacteria, and the study of protozoology. The first issue is planned for December, 1947.

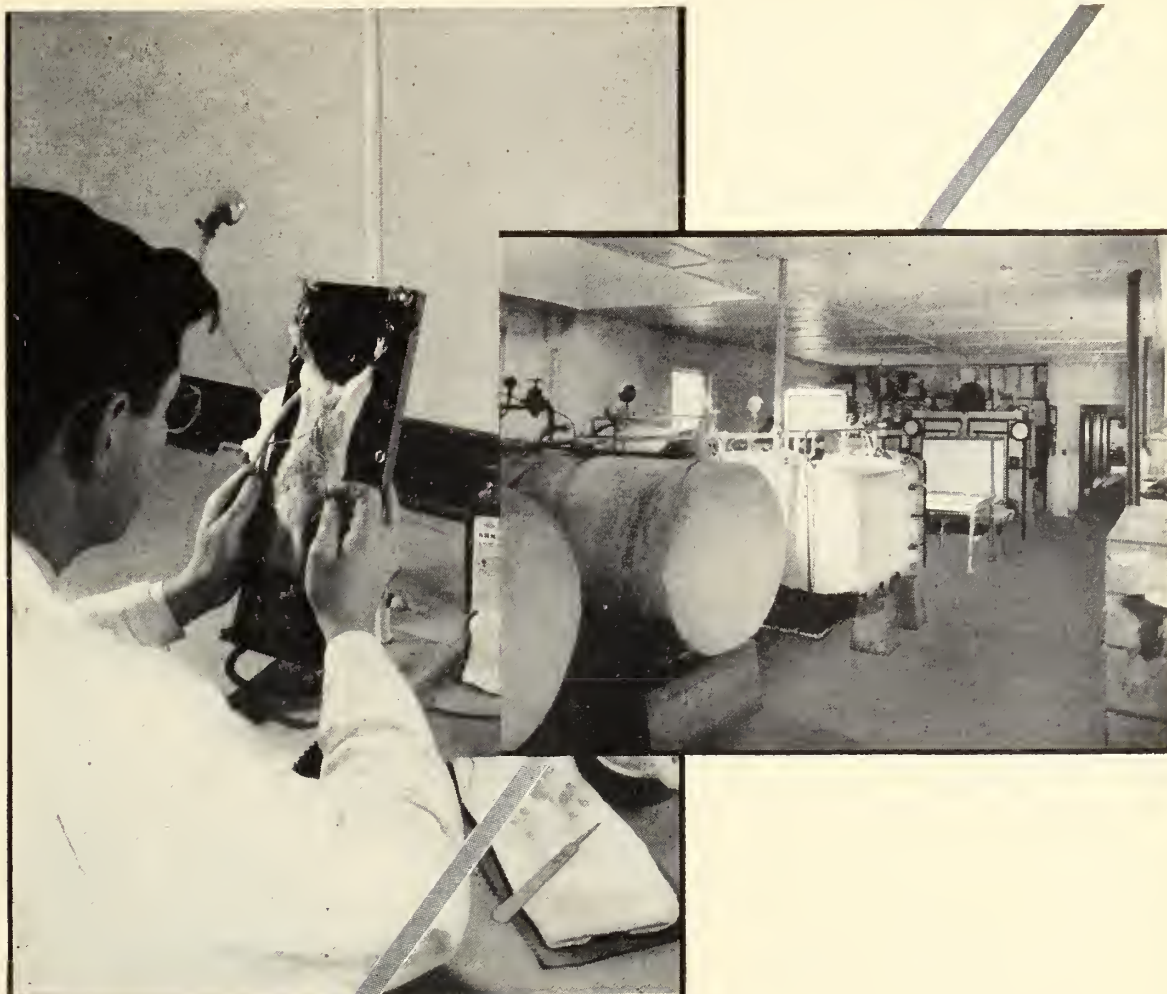
The American Board of Obstetrics and Gynecology announces that the next written examination (Part I) will be held in various cities of the United States and Canada on February 7, 1947. All applications to take the examination must be in the office of the secretary of the board, 1015 Highland Building, Pittsburgh, Pa., by November 1, 1946.

Two grants totaling \$14,500 have been made to the University of California and the university's Medical School for study of medical and physical sciences, according to announcement by the John and Mary B. Markle Foundation. Dr. Ernest W. Page of the Medical School and David M. Greenberg, Ph.D., are the winners of the awards.

Voluntary Health Insurance Weeks have met with much enthusiasm in towns and counties where they have been observed thus far and have found "unexpectedly favorable response from both public officials and private citizens," says *Underwriters Report*, insurance trade magazine. Campaigns are being conducted by California Physicians' Service with strong support from the insurance industry. Druggists have given unexpected financial and vocal support to the campaign, says *Underwriters Report*.

Endorsement of compulsory national health insurance legislation was given before the Senate Labor Committee considering the Wagner-Murray Bill by Alfred B. Lewis, president of Union Casualty Company, New York. Although admitting it would "put my company out of business," the insurance executive said, "I am in favor of it because I am impressed by the great need for this form of social security and by the prospects of continued and embittered industrial strife if this bill is not passed."

Full endorsement of the California Physicians' Service-Blue Cross pre-paid medical care plan was given recently by the executive board of the Los Angeles joint council of Teamsters No. 42. The board, expressing "appreciation and full approval," said that individual teamster participants in the plan are "unstinting in their praise."



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JOURNAL QUESTIONS POWER OF VITAMIN E TO RELIEVE HEART DISEASE

An editorial appearing in the June 29 issue of *The Journal of the American Medical Association* challenges the reported miraculous powers of vitamin E in heart disease and states that "far too often of late there has been overemphasis in the popular press on research too fresh from the laboratory and too inadequate as to evidence to permit evaluation."

The Journal article says:

"Announcement in newspapers and particularly in *Time* that large doses of vitamin E will bring relief from all common forms of heart disease once again prompts discussion of the manner in which the results of medical

research should be brought to the attention of the public. Far too often of late there has been overemphasis in the popular press on research too fresh from the laboratory and too inadequate as to evidence to permit evaluation. The reported discovery of new and almost miraculous powers of vitamin E needs careful evaluation and confirmation because the substance had already been investigated by many competent clinicians and found wanting. Nothing in the known pharmacologic actions of vitamin E would lead one to suspect either a vasodilating [dilating of blood vessels] action, a myotonic [tonic spasm of a muscle] effect or an ability to repair damaged heart muscle in human beings."



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EAST OR WEST?

KIPLING'S "East is East and West is West and never the twain shall meet" was not meant to apply to the United States. The West was sired by the East and the older section of the country is constantly learning from the younger.

How fine for a child to know from actual experience both parts of the country! "Send your boy or girl to our Santa Barbara School," says the Devereux Schools to parents in the East—"let him go to school in California and be able to bring back vivid first-hand impressions of the Golden West." To Western parents, Devereux says, "Why not send your child East to that cradle of liberty, Philadelphia—give him the steady background that comes from the older, more mature part of the country?"

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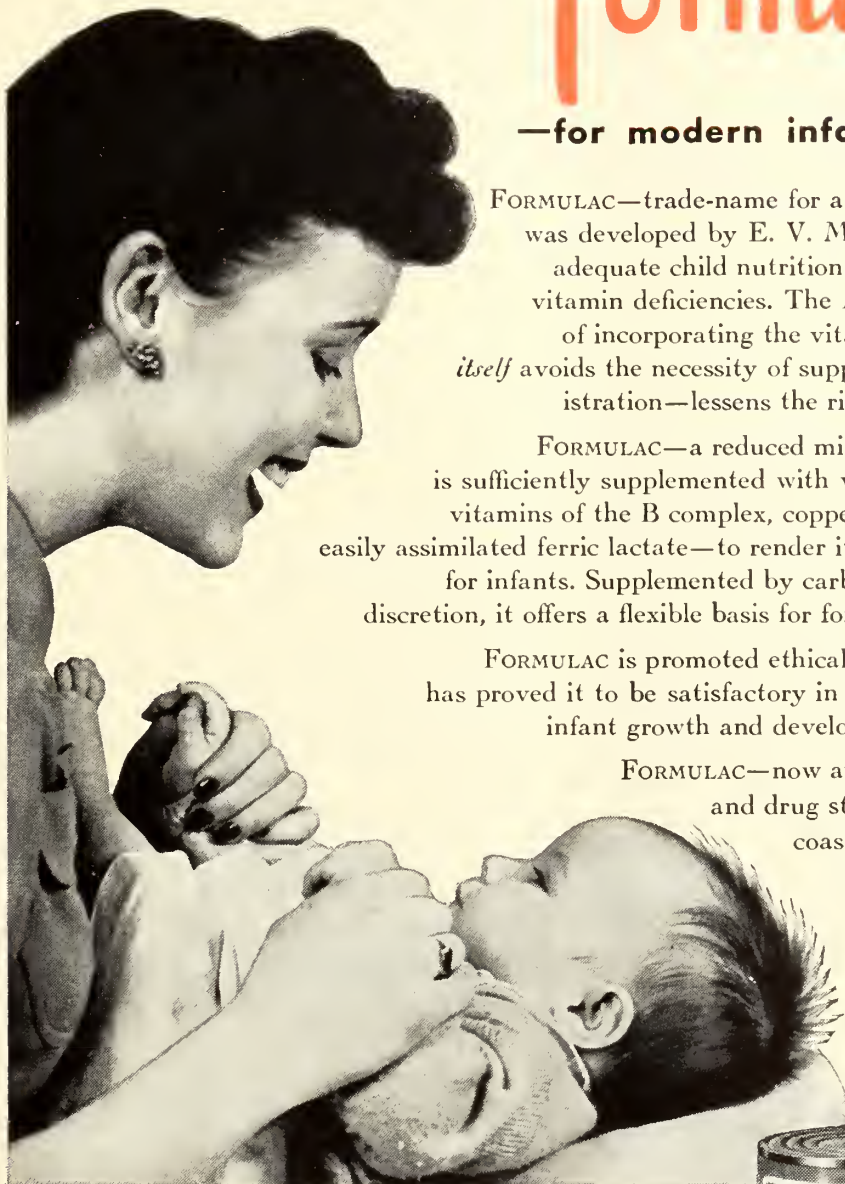
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Ingram Laboratories announce formation of the INGRAM RESEARCH INSTITUTE, dedicated to the development and research of new products to better serve the medical profession.

Cecil Z. Wawra, director of the Ingram Research Institute, graduated from Sorbonne University, Paris, France, receiving his Chemical Engineering degree at the University of Geneva. After coming to the United States he served as Research Assistant at the California Institute of Technology followed by a research assistantship at the University of Southern California.

Among his original published papers are works on "Blood Pressure Reduction Substance," "Marihuana—Its Active Principle," and more recently his work on "Vitamin P," resulting in the isolation of Hesperidin in the form of Hesperidin Chalcone.

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ANGINA MORE
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—Headline in *San Francisco Examiner*.

The male of the species is deader than the female.

Report was erroneous about Rosemary De Camp being in one of the houses struck by the Hughes plane. Lucky for her, too, because she is expecting a baby any minute—*From Harrison Carroll's Hollywood column in the San Francisco Call Bulletin*.

Come to think of it, we could name a dozen or more people who are lucky not to have been in a house struck by the Hughes plane—and not all of them pregnant, either.

DOCTORS STUDY
HEADACHES

—Headline in *San Francisco paper*.

Introspective bunch, aren't they?

Quick, Armand: The Hemorrhagic Diseases.—*From the bibliography for an article in California Medicine*.
As for us, we'll just stick to Henry and the Flit.

Married couples are discovering that they will stay together longer if they sleep apart. J. Paul Fanning, secretary and general manager of the National Association of Bedding Manufacturers, said today.

"They'll also sleep better," he said. "Husbands and wives are discovering that two in a bed makes a crowd. They are getting tired of dodging each other all night."

Fanning said that most people sleep like tops—they spin all night. The average sleeper changes his position at least 20 times a night. Really active ones turn over 45 times.

"You have to turn to be relaxed," he added. "If there's a big barrier there, it won't let you roll over, and you won't rest as well."—*From a United Press news item by Claire Cox*.

A distiller obtains from 1.8 to 2.3 gallons of alcohol from 100 pounds of potatoes. Thousands of carloads of potatoes are consumed in this manner.—*From Lon Hughes' financial column in the San Francisco Examiner*
That's the spirit!

* * *

Mobile chest x-ray laboratories which can take the facilities for mass examinations to any community have been ordered by nine states and Hawaii and by county health departments in three states, according to Westinghouse Electric Corporation, whose X-Ray Division designed and is building the units.

Because "experience has proven a reluctance on the part of many persons to visit hospitals or clinics for examinations which would disclose tuberculosis while it is still in curable stage," the company's announcement says, the mobile laboratory was developed to implement efforts of health services toward early identification and treatment of the disease.

The laboratories on wheels were shown at the National Tuberculosis convention in Buffalo, New York, in June.

California M E D I C I N E

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Anesthesia For Emergency Surgical Procedures*

CHARLES F. McCUSKEY, M.D., *Los Angeles*

EMERGENCY surgical procedures are frequently necessary when shock is present due to trauma, hemorrhage or to rupture of a viscus. In each instance the general clinical condition of the patient must be carefully considered when the type of anesthetic to be given is being decided upon.

Every surgeon recognizes the fact that adequate exposure, hemostasis and gentleness in handling tissues are essential. The anesthetist can aid in securing these factors by producing adequate muscular relaxation. When this can be secured without undue disturbance of normal physiologic functions, the patient's chances for survival are increased.

Before an anesthetic agent is selected its pharmacologic action should be considered and this action correlated with the clinical condition of the patient. It is generally accepted that ether produces a general peripheral vasodilation and when carried to the lower planes, a depression of vasomotion is common. Pentothal sodium also produces a peripheral vasodilation. Spinal anesthesia and regional blocks produce vasodilation in the anesthetized area. Frequently there is a compensatory vasoconstriction in the un-anesthetized area.

The body's first reaction to blood loss or trauma preceding shock is a peripheral vasoconstriction. This is the automatic attempt of the body to maintain sufficient blood for the vital centers. Following the administration of blood or plasma to patients who have had a severe drop in blood pressure, the pressure may rise to 100 or 120 systolic. This rise may occur before the total volume of blood lost has been replaced and is only possible because of the peripheral vasoconstriction still present. The administration of an anesthetic which

produces vasodilation at this time will produce an immediate severe drop in blood pressure.

Before any type of anesthetic is administered the patient should have:

1. Treatment of shock by administration of whole blood in adequate amounts.
2. Adequate premedication to allay pain and apprehension.
3. The stomach emptied, if food has been taken shortly before or following injury.

Sound surgical practice requires that normal physiology be maintained during operations and following. Patients suffering from trauma or hemorrhage or in shock from any cause prior to surgery, should have adequate treatment before any anesthetic is administered. The fundamental physiological abnormality in shock is an imbalance between the volume of circulating blood and the vascular bed. This may be due to loss of blood, loss of fluid, or to peripheral vasodilation.

Knowledge of the hemoglobin, hematocrit volumes per cent and plasma protein content of the blood will aid in determining the type of fluid most indicated.

	Hemoglobin	Hematocrit Vols Per Cent	Plasma Protein Grams Per Cent
Nomals:	13.5-15.0	42-47	6.3-7.5
Shock Traumatic without Hemor- rhage	15.0 and over	45-60	7.6-9.9
Dehydration with Shock	15.0-20.0	50-60	7.6-9.9
Burns (Severe)	20.0-21.0	60-70	4.1-5.
Hemorrhage (Severe)	7.0 or less	28 or less	5.8-5.1
Shock—Traumatic with Hemorrhage . .	10 or less	35 or less	6.5-5.5

There is no substitute for whole blood. Plasma restores the blood pressure and provides protein, but only whole blood contains the erythrocytes essential for the transport of oxygen. The amount

* Read before the Section on Anesthesiology, at the Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

of whole blood needed is the amount required to restore and maintain normal physiology.

RH FACTOR

Eighty-five per cent of the white race and 94 per cent of negroes have red blood cells containing Rh agglutinogens, and these individuals are called Rh Positive. Rh positive recipients are never susceptible to Rh incompatibility reactions.

Rh negative recipients lack Rh agglutinogens. They will never react unfavorably to Rh negative donors, nor to the first Rh positive donor, or to a series of Rh positive donors if the transfusions are given over a short period of time. They may become iso-immunized to transfusions of Rh positive blood so that a subsequent transfusion with Rh positive blood leads to an incompatible reaction. The limits of the danger and safety zone are not definitely known. At present it is thought that if an Rh negative recipient has received a transfusion of Rh positive blood ten days or more before receiving the second transfusion from an Rh positive donor, an incompatibility reaction may result. From the practical point of view, if a patient is receiving repeated transfusions and the interval between the first and last is ten days or longer, some danger exists. The first reaction due to Rh incompatibility is rarely severe in the male. If a reaction occurs in these circumstances in a patient who has not been tested with Rh grouping serum, no further transfusions should be given until he has been tested. If he be Rh positive, the reaction must have been due to something other than Rh incompatibility. If he be Rh negative, all subsequent transfusions should be from Rh negative donors.

The symptoms of hemolytic transfusion reactions consist of:

1. A sense of increased heat in the skin.
2. Headache.
3. Sense of constriction in the chest.
4. Pain in the lumbar region.
5. Rigor.
6. Fever.

The first 100 cc. of every transfusion should be given slowly and if any of the above symptoms appear, the transfusion should be stopped at once.

The dangers of giving excessive quantities of fluids is about equivalent to that of giving too little. Pulmonary edema may result from pushing too far the administration of fluids. Patients with reduced pulmonary circulation due to collections of pleural air, fluid or blood, require careful and repeated observation of the condition of the circulation, and all fluids should be administered with caution.

When it is impossible to control hemorrhage and surgical intervention becomes necessary in the presence of shock, two or more large needles should be inserted and an adequate supply of blood should be available before starting the anesthetic. In this way blood can be administered rapidly until the bleeding point can be found and the hemorrhage checked. Frequently 3,500 cc. or more of blood may be needed rapidly.

Clinical experience has demonstrated that pa-

tients in shock do not tolerate spinal anesthesia well. Likewise they do not do well under deep ether anesthesia nor pentothal. These contraindications are relative and depend to a certain extent upon the care that is given the patient by the anesthetist. For instance, a patient in shock due to injury to the lower extremity may do well under spinal anesthesia if the dose is small and the height of anesthesia restricted to the lower extremities. Likewise, pentothal can be used for a patient in shock, if adequate oxygen is given and the dosage kept to a minimum far below that required for a patient in good condition.

In most cases where muscular relaxation is essential, some type of regional block offers the patient the greatest margin of safety. By relieving pain, it is of definite benefit in preventing the onset of shock. Thoracic injuries where breathing is decreased because of pain show marked improvement following intercostal block.¹

The use of regional field block for head injuries, brachial block for upper extremities, paravertebral block for reduction of dislocations of the vertebrae, intercostal or abdominal field block for abdominal surgery, has been described repeatedly in the literature and in textbooks. When the anesthesia produced by a block is not adequate, it should be supplemented with a general anesthetic. For patients in shock or impending shock, cyclopropane is the agent of choice as it disturbs the normal physiological processes less than any of the other agents.

Of the local anesthetic agents available, three are used most often—Procaine, Intracaine and Metycaine. Procaine is the least toxic of these agents and Intracaine is slightly more toxic. Using cocaine as a basis of comparison with an intravenous toxicity of one, Procaine is one-quarter as toxic, Intracaine is one-third as toxic and Metycaine three-quarters as toxic. Since all untoward reactions to local anesthetic agents are due either to rapid absorption into the blood stream or to an intravenous injection, the intravenous toxicity is the only one to be considered. An overdose of any of these agents produces respiratory paralysis ahead of cardiac failure, so there is usually adequate time for resuscitative measures.

The duration of anesthesia obtained in regional blocks will vary with the accuracy of the block and the amount of solution deposited in close proximity to the nerve. Procaine ordinarily produces anesthesia for 90 minutes, Metycaine lasts longer than Procaine, and Intracaine lasts 180 minutes. Intracaine and Metycaine have no antagonistic action to the sulfa drugs.

My associates and I have now used Intracaine for all types of regional blocks in well over 2,500 cases. The onset of anesthesia has been rapid and the number of untoward reactions has been minimal. Because of the rapid onset of anesthesia and the duration, we consider it the agent of choice.

SUMMARY

In emergency surgical procedures where shock is a factor, regional block alone or supplemented

with cyclopropane offers the patient the greatest margin of safety.

Replacement of fluid loss before administration of any anesthetic is desirable. When this is not feasible, adequate amounts of whole blood should be available for use during and following the operation.

An anesthetic agent and method should be used

that will not further accentuate the degree of shock present.

305 South Westlake Avenue.

REFERENCE

1. Samson, Paul C., and Fitzpatrick, Leo J.: Inter-costal Nerve Block, California and Western Medicine, 62:254 (May), 1945.

Treatment of Bladder Tumors*

ROGER W. BARNES, M.D., C. LEROY TURNER, M.D., AND R. THEODORE BERGMAN, M.D.

Los Angeles

IN the compilation of this paper an effort has been made to evaluate the results of different modes of treatment of vesical neoplasms. The use of radiation in the form of radon emanation seed implantation is given special study.

There have been numerous reports of the use of radiation in the treatment of bladder tumors, but the results have been so varied that it is difficult to draw a definite conclusion as to the efficacy of this therapy. Beer² in his monograph on the subject reported that the use of radium is unsatisfactory, and that radical surgery is preferred. Barringer¹ in 1934 stated that the implantation of radon seeds was the ideal treatment for vesical neoplasms, but Dean and Balfour³ in 1941 were not enthusiastic about the results of any treatment. However, in their series, 14 per cent of 52 cases of infiltrating carcinoma lived more than five years after radiation. Parmenter⁴ found that patients treated with resection and fulguration, followed by implantation of radon seeds or application of radium, progressed more satisfactorily than those who did not obtain this treatment.

Endoscopic electrosection and fulguration has been the method used for removal of the tumor in most of the cases reported here. When this is performed properly, it is preferable to suprapubic removal, unless the tumor is more than five centimeters in diameter, or unless it is situated in the ventral portion of the dome of the bladder. A more thorough removal of tumor tissue can be accomplished through the endoscopic approach because the tissue can be examined minutely and thoroughly through the lens system of the instrument, and a differentiation between tumor tissue and bladder muscle tissue can be made.

From this observation it can be determined whether all the tumor tissue has been removed. Some tumors infiltrate beyond the bladder wall, and in these cases removal by any method is incomplete. There is danger in resecting entirely through the bladder wall, and an extravasation into perivesical tissues resulting when the endoscopic approach is used; but this is minimized

when the operator is familiar with the difference in appearance of the tissues. When the bladder musculature is seen through the lens, no more tissue is removed from that particular area. Elongated bundles or strands of tissue of varying thicknesses, which have a glistening, somewhat fibrous appearance, are characteristic of bladder muscle, whereas tumor tissue is granular or fuzzy and is of a softer and more homogenous texture. When the removal of tissue extends through the bladder wall, a darker or black area, crossed by numerous spider weblike strands, appears. If this is immediately recognized, and the resection discontinued, suprapubic drainage of the bladder or of the perivesical spaces is not necessary. When, on the other hand, it is not recognized, and distention of the bladder is continued until there is extravasation of considerable fluid, perivesical drainage through a small suprapubic incision is indicated, but cystotomy is seldom necessary. Tumors more than five centimeters in diameter, and those situated in the ventral portion of the bladder, should be removed through the open approach.

SOURCES OF DATA

The data presented in this paper was derived from a review of 537 cases of bladder tumor obtained from our office files which were seen between the years 1926 and 1945. Of these, 186 cases were eliminated from the study because of insufficient data. Inability to obtain recent follow-up reports was the chief reason for their rejection, and many were not included because of lack of grading of the tumor as to malignancy. There remained a total of 349 cases which were used. Inasmuch as there were so few which had open surgery, in comparison with those having endoscopic electrosection, and inasmuch as the results of treatment in these two groups were very similar, a further breakdown into the different methods of approach in removing the tumor would be somewhat confusing and of very little significance.

The term electrosection and fulguration, as used here, signifies the removal of the major portion of the tumor with the cutting current and loop electrode, either endoscopically or through a suprapubic cystotomy opening, and fulguration

*Read before the Section on Urology at the annual meeting of the California Medical Association, Los Angeles, Calif., on May 7-10, 1946.

From the Department of Surgery (Urology), College of Medical Evangelists School of Medicine, Los Angeles.

of the base and edges of the resected area with the dessicating current. In this study, the above mode of treatment, without the subsequent implantation of radon emanation seeds, is compared with the same treatment plus the implantation of radon.

The size of the tumor influenced the length of life of the patient. Inasmuch, however, as the average size in the two groups of patients studied (those with radon treatment and those without) were similar, this factor made no significant difference between these two groups.

During the past five years radiation has been used in the form of radon emanation seeds implanted into the tumor-bearing area in most cases having a grade II or more malignancy. The papillomata and grade I malignancies, which have been grouped together in this report, were seldom treated with radiation because the tendency in these cases is for the recurrence of the tumor to be in a different location in the bladder from the original growth. Therefore, the implantation of radon seeds into the site of the original tumor would be of no value. The usual time of implantation of the seeds was four weeks following resection and fulguration of the growth. By this time most of the dessicated tissue had sloughed away, and a deeper, more accurate implant was possible. Two and five tenths millicurie seeds placed one centimeter apart were used during the first few years; but more recently, due to the fact that smaller seeds were more available, one and five tenths millicurie seeds, placed about one-half centimeter apart throughout the tumor-bearing area of the bladder wall, and embedded about one centimeter deep, have been used. In most cases the implantation was done through the cystoscope, and if this is performed correctly, it is as accurate as when the open suprapubic approach is used.

The compilation of the statistical data separates the living patients from those who have died, for in so doing a more accurate evaluation of the results can be obtained. For example, if these were all considered together, a patient with a papilloma who was followed for two years and was still living would be counted as having the same survival period as a grade II carcinoma who died in two years. This would obviously be an erroneous comparison.

The most accurate comparison of results of treatment can be obtained from Table I, for all of these cases were followed until death, thus eliminating the indeterminate factor of the future life expectancy in the group who are still living. The data in this table shows that patients with grade II and III tumors who were treated with electrosection plus implantation of radon emanation seeds, lived longer than those in the group which did not receive the radiation. This difference is significant for the average length of life from the onset of symptoms to death in the group who had no radon seeds implanted was approximately two-thirds of that in the group which received the radiation. None of the patients who had papillomata or

grade I malignancies treated with radon seeds are dead.

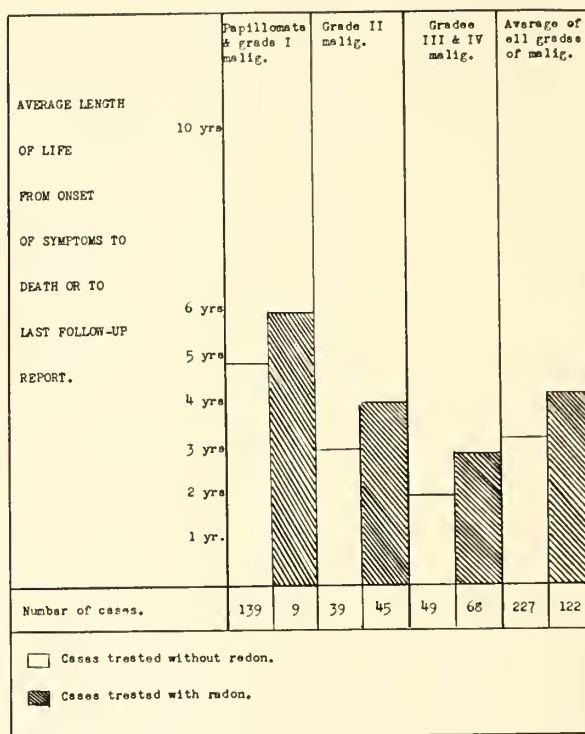


Table I.—Group of patients with bladder tumors who have died. Comparison of those treated by electrosection and fulguration alone with those treated by these modalities plus implantation of radon emanation seeds.

Table II gives the length of life from onset of symptoms to the last follow-up report in the patients who are still living, and compares the group which had implantation of radon seeds with the one which did not have the radiation. There is a significant increased length of life in the former group. Similar results are obtained when combining the group who are dead and those who are still living as shown in Table III. All of these patients had electrosection and fulguration of the tumor.

Table IV gives the present status of all cases treated, showing a comparison between those treated by electrosection and fulguration only with those treated by these modalities plus implantation of radon emanation seeds. The percentages given show a comparison between the radon treated cases and the non-radon treated cases. They indicate the proportion of cases in each malignancy grade group treated without radon who are dead, who are still under treatment or arrested less than one year, who are arrested for one to five years, or who are arrested over five years, in comparison with the cases in the same malignancy grade group treated with radon who are dead, arrested less than one year, arrested for one to five years, or arrested over five years. The group of those who are arrested for less than one year is composed of those patients who are still under treatment and upon whom repeated resections, fulgurations, and/or implantation of

radon seeds are being done at less than yearly intervals.

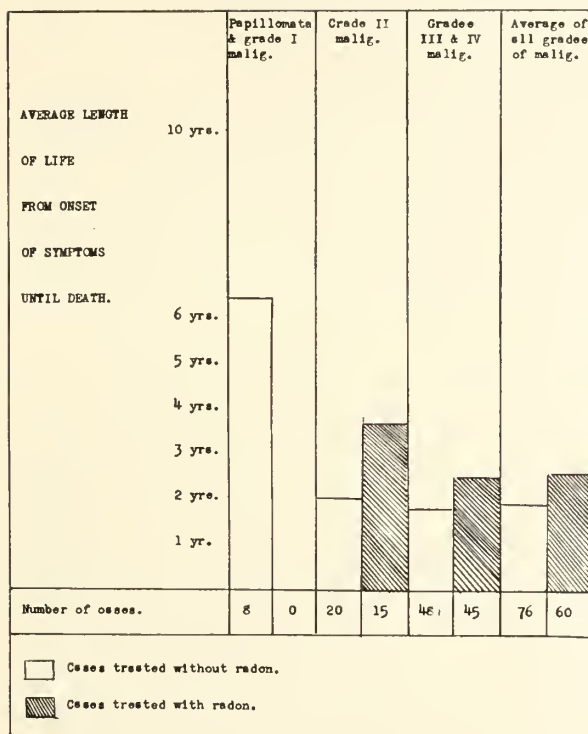


Table 2.—Group of patients with bladder tumors who are still living. Comparison of those treated by electrosection and fulguration alone with those treated by these modalities plus implantation of radon emanation seeds.

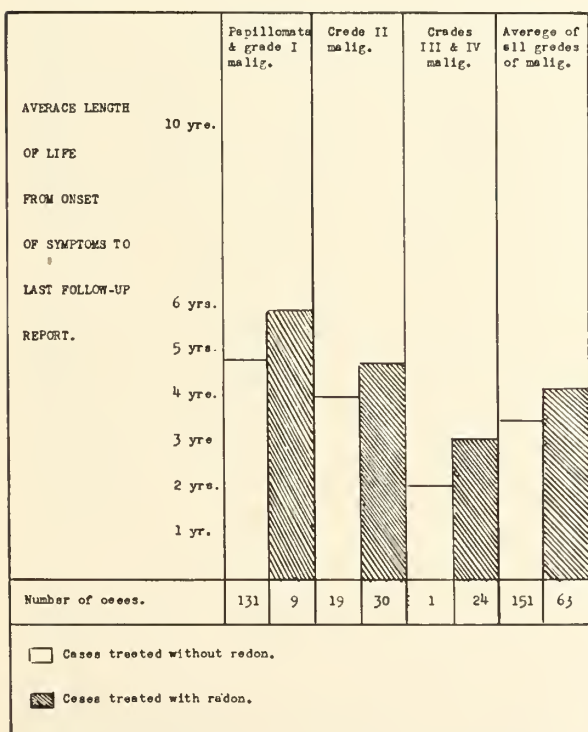


Table 3.—Group of patients with bladder tumors (living and dead) followed more than one year. Comparison of those treated by electrosection alone with those treated by these modalities plus implantation of radon emanation seeds.

Inasmuch as the majority of patients treated with radiation in this series have been seen during the past five years, there are not many who are listed as arrested more than five years. However, the table does show a definite tendency toward a larger number being arrested one to five years in the group treated with radiation.

Grade of Malignancy.	No. of Pts.	Without or With Radon Seeds		Pts. Dead		Under Treatment		Arrested 1-5 yrs.		Arrested over 5 yrs.	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Papillomata and grade I malig.	146	Without Radon	139	8	6	39	26	72	48	20	14
		With Radon	9	0	-	4	3	5	3	0	-
Grade II malig.	84	Without Radon	39	20	24	10	12	8	10	1	1
		With Radon	45	15	18	14	16	15	18	1	1
Grade III & IV malig.	117	Without Radon	49	48	41	0	-	0	-	1	1
		With Radon	68	45	39	19	15	4	3	1	1
All Grades	349	Without Radon	227	76	22	49	14	80	27	22	7
		With Radon	122	60	17	37	10	24	7	2	1

* Indicates the percent of all patients treated without radon in each grade of malignancy who are dead, under treatment, arrested etc. In comparison with all patients treated with radon in each grade of malignancy who are dead, under treatment, arrested etc.

Table 4.—Comparison of results of treatment of bladder tumors by electrosection and fulguration alone with those of treatment by these modalities plus implantation of radon emanation seeds.

It is evident from this study that the more malignant the tumor is, as determined by histopathological examination, the shorter is the life expectancy of the patient. All the tables show that the patients with a papilloma or grade I carcinoma live longer than those having a grade II malignancy, and these in turn outlive the ones with a grade III or IV neoplasm. It can, therefore, be definitely stated that the grading of a bladder tumor aids the surgeon in giving a prognosis to his patient.

SUMMARY AND CONCLUSION

In this series of 349 cases with bladder tumor, there is a significant difference in results of treatment between the group which received electrosection and fulguration without radon emanation seeds, and the group which received this mode of treatment plus radon. The latter group have a longer life expectancy, and the results of treatment are superior to those obtained in the first group.

The study also shows that the higher the grade of malignancy of the bladder tumor, the poorer the prognosis, and that in general the results of the use of radon seeds in the more malignant tumors (grades III and IV) are not as good as when used in the grade II tumors.

DISCUSSION BY H. C. BUMPUS, JR., M.D., PASADENA

Contributions such as this excellent survey by Dr. Barnes and his associates dealing, as it does, with a comparison of the results obtained in treating tumors of the bladder by two different methods seems to me absolutely essential if urologists are ever to reach an agreement as to the best method of treating these unfortunate patients.

At a recent meeting of the Western Branch of the American Urological Association this subject was being discussed and one of the members recalled that a decade ago he had asked the guest speaker, Dr. N. G. Alcock, how he was treating tumors of the bladder. Dr. Alcock replied, "The surgeons have had a go at it; I'm using radiation in the future—the results cannot be worse." Now, after a lapse of ten years, Dr. Alcock told the members that while the results hadn't been any worse, he didn't believe they had been any better. He was now in favor of radical surgery, believing that the improvement in technic and chemotherapy during the past ten years would result in sufficient cures to warrant the increased risk. He remarked, "After all, it is a cure that we are shooting at!"

It happens that the method Dr. Barnes uses, of electrosection and implantation of radon seeds, is the one I have usually employed. Perhaps that is why I was asked to discuss this paper. The dictum of "kill or cure" so frequently followed in cases of malignancy has never had much appeal for me. It so completely disregards those cases that are neither killed or cured. These unfortunates are too frequently doomed, not alone to periods of post-operative discomfort, pain and suffering, but frequently succumb to their malignancy far sooner than if no attempt had been made to cure them. Were it, in fact, a choice between death and cure, I could agree, but cures have occurred too infrequently to offset the high mortality and morbidity incident to such efforts.

Electroexcision with radon implantation, on the other hand, the results of which Dr. Barnes has so carefully studied, carries neither the mortality rate nor the morbidity associated with more radical methods. Yet it offers for a greater number of any group a prolongation of life and occasionally a possible cure. That, on the whole, adds up, I believe, to more years of life than the occasional cure by radical surgery.

I hope, as Dr. Alcock does, that in the future a report as convincing as Dr. Barnes', showing beyond question that surgery is as superior to electro-coagulation and radon implantation as Dr. Barnes has shown radon implantation is superior to electro-excision alone, will be published: to date none exists.

DISCUSSION BY GILBERT J. THOMAS, M.D.

Dr. Barnes has given us in his paper an evaluation of results of the methods of treatment of urinary tumors employed by him, with special references to the use of radiation in the form of radon emanations. The writer uses endoscopic electrosection and fulguration which his experience indicates is preferable to suprapubic removal unless the tumor is more than five centimeters in diameter or situated in the ventral portion of the dome of the urinary bladder.

The result of treatment of urinary bladder tumors of all grades are very disturbing to me and to most urologists. We have changed our methods of treatment when new weapons were developed such as resection, fulguration, X-radiation, and radon seeds. Combinations of these methods of treatment have been employed and yet the cures are few; the recurrences continue and patients' survivals are not lengthened very much when all urologists' results are tabulated and their methods of treatment are evaluated. In other words, we are not gaining control of bladder tumors, and we produce few cures. Why is this so?

Dr. Barnes has just suggested a combination of weapons that he used to *control bladder cancer* that has produced the best results, *i.e.*, comfort to the patient and longer survival, but not cures.

For a number of years the American Urological Association

has maintained a bladder tumor registry at the Army Pathological Museum in Washington, D.C. This registry was created because we want to centralize all data concerning the pathological examination of tissue obtained from bladder tumors and use a uniform method of grading the malignancy of these. Accompanying the tissue submitted to the registry for microscopic study and grading, we require a description of the treatment used, the immediate results produced and the data obtained during follow-up examinations, so that the accumulated data should reflect the best methods of treatment to be employed for each of the four grades of malignancy. The results revealed in the compilation of these data as published by the Carcinoma Registry Committee of the American Urological Association were and still are poor and no consensus has developed among the members.

My opinion concerning the treatment of bladder tumors which is based on over 30 years' experience in clinics and in private practice may be epitomized as follows:

1. We have failed to get a correct estimate of the degree of malignancy of bladder tumors, because we have not obtained specimens of tissue from that part of tumor in which we are most interested, *i.e.*, its base and the bladder wall adjoining. Specimens of tissue from these important areas are rarely obtained transurethrally. If this method of biopsy is employed, injury to and sometimes rupture of the bladder wall may occur. If these statements are true (and I believe they are), then the diagnosis of the presence of malignant change in the tumors, and their gradation, in many instances may be incorrect. How can adequate treatment be applied if a wrong pathological diagnosis is obtained?

2. Why should cancer of the urinary bladder, which metastasizes early, be treated differently than other malignant growths? When cancer occurs in other anatomical areas, the slogan is early correct diagnosis of the nature of the tumor, and if malignant change has occurred, then early, wide and complete removal of the involved area or the organ. *Cystectomy partial or complete is now reserved for tumors that cannot be easily attacked through the urethra or are pronounced inoperable.* When the removal of adjacent organs becomes necessary this is not a different condition to that associated with cancers in other organs or tissues. Cancer is a life-taking disease at any age, and our aim should be to save lives by eradication of this disease and not be satisfied with any method of procrastination.

3. Complete surgical removal of cancer of the bladder aimed at a cure should be our method of attacking this life-taking disease. It should be done as soon as the diagnosis of malignancy is made. Complete surgical removal should be the first method of attack, and not used when the local condition is obviously inoperable, because of its extent, and destructive effect, or because the patient's general condition has been damaged by the toxemia from the cancer so that he or she cannot withstand the trauma incident to any surgical operation of this magnitude.

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The Onset of Ovulation During the Puerperium*

ROBERT A. LYON, M.D. AND MARY JANE STAMM, M.D., *San Francisco*

THE physiology of reproduction may be considered to pivot about the process of ovulation. This event ordinarily occurs in the young adult within two years after the onset of the first menstruation. It is the result of progressively increasing secretion of gonadotrophic hormone, sufficient in later cycles, to bring about the normal follicular maturation culminating in ovulation. In a similar way the factors influencing the ovaries following parturition until normal cycles recur are insufficiently known.

The intent of this presentation is to report an investigation† of the pattern and time of recurrence of ovulation following parturition, conducted primarily by means of the basal body temperature method.

Ovulation in non-lactating puerperae appears at an average time of 10.2 weeks post-partum.⁵ Other workers, Griffith and McBride² utilized the endometrial biopsy method of studying various endometria, among them a series of 21 normal puerperal women observed for two to twenty-four weeks post-partum. They were divided into lactating and non-lactating groups. The former lactated over a range of two to nine months. Menstruation and ovulation occurred while lactation was still going on in as many as 20 per cent. The remainder had neither ovulation nor menstruation until after weaning. According to these observers, lactation continued three and five-tenths months with anovular flow at an average of five months, while the average of the initial ovulations appeared at five and five-tenths months. These observers noted further that the non-lactating patients menstruated at an average of two months post-partum and ovulated quite late, apparently not prior to five months post-partum. Moreover, ovulation was preceded by anovular menstruation in 95 per cent of these non-lactating women.

Kurzrok, Lass and Smelser^{3,4} studied 30 lactating patients who were menstruating, and noted 55 per cent of this selection had anovular cycles. Accordingly, a high incidence of ovulatory cycles in lactating women who menstruate can be expected.

Topkins⁹ also observed a small series of 28 puerperal women from whom he secured 45 biopsies over weekly intervals. He was interested in the degree of ovarian suppression during lactation as reflected in the endometrium. These en-

dometria were in a static phase in 85 per cent and suggested that the follicles neither regressed nor matured ordinarily during lactation. Proliferation was present in 94 per cent (136 specimens) of which 15 per cent were temporarily hypoplastic. Hence, but 6 per cent of the tissues were progestational.

Routine endometrial biopsies from presumably healthy young women show anovulation in approximately 5 per cent of all cycles.⁶ Moreover, in patients with low fertility, Rock⁷ observed that 9.1 per cent had anovular cycles. These data, together with Kurzrok's finding of about 40 per cent ovulatory cycles in menstruating, lactating puerperal women, are the available background for studies regarding normal ovarian function following parturition.

Studies of the early and late puerperium which show endometrial, basal temperature, ovulatory and progestation dissimilarity from the non-puerperal cyclic woman, may be a basis for a revision in our conception and terminology of the puerperium. While many arbitrarily use a six weeks limit for this term, in a physiological sense it may encompass a longer period, as the puerperal transition to the normal state seems to be gradual and extended.

The basal body temperature method of observation has been well described and the method seems to be established on a firm basis in the puerperal woman.⁸ A sufficient number of endometrial biopsy correlations have established that in the normal progestational (raised temperature) phase there are regularly found definite secretory changes in the endometrium, which in turn are followed within a few days by menstruation.

PROCEDURE

Fifty unselected puerperal women, aged 18 to 37, most of whom were primiparae, have been followed by means of the basal body temperature method for resumption of the normal ovarian cycle from the time they left the hospital until approximately six months post-partum. Basal body temperatures were taken per rectum at approximately the same time each morning before rising. Endometrial biopsies were taken in selected cases for correlation purposes during the phase of elevated basal temperatures, during the time that a functional corpus luteum would be expected.

RESULTS

The patients observed in this study may be divided into three groups according to the duration of lactation. Twenty-four of them lactated for one week or less; seventeen continued for a month and nine lactated for one to three months.

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From the Division of Obstetrics and Gynecology, University of California Medical School, San Francisco.

The writers are indebted to Mrs. Margaret Crile for technical assistance.

† This study was supported in part by the Winthrop Chemical Company.

In the group of non-lactating patients, the average onset of the catamenia was 7.7 weeks post-partum, for those lactating a month the initial menstruation occurred at 7.9 weeks, while for the group lactating longer, namely from four to twelve weeks, the average menstruation occurred at eleven weeks post-partum. It appears that the average onset of menstruation is delayed following parturition in proportion to the length of the lactation period. The interval of lactation duration to the first menstruation (L-M) decreases progressively from 7.7 weeks to four weeks in those lactating for four weeks and to 1.7 weeks in the remaining group of those lactating for more than four weeks.

The initial ovulation following parturition in those cases which did not lactate occurred at an average of 10.2 weeks, increased slightly to 10.6 weeks when lactation continued for four weeks and appeared at an average of 17.0 weeks after three months of lactation. Thus, the lactation to ovulation (L-O) interval decreased markedly from ten weeks in the non-lactating group to 6.6 weeks in the four weeks lactation group and to 0.4 of a week in those lactating about two months. The L-O interval mean became zero by eight months post-partum.

The endometrial biopsy specimens show stromal growth with striking large spindle-like cells, abundant loose reticulum and notable hypovascularity. Many apparently resting endometria actually have distended uterine glands which appear to be stimulated mildly, often growing closely together. In sequence to the estrogenic manifestation, when ovulation has occurred the progestational effects ordinarily seem incomplete and quantitatively slight.

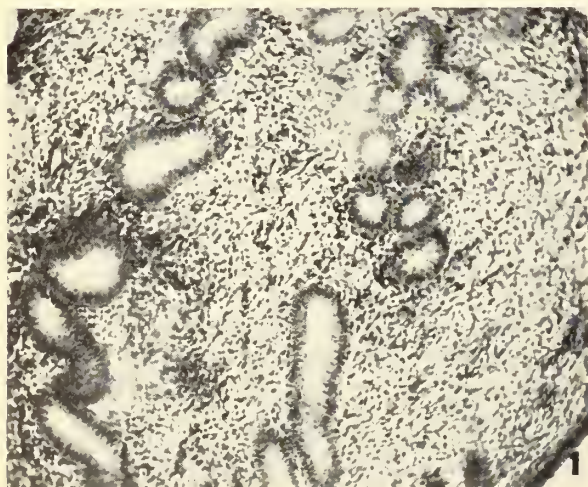


Fig. 1.—A. A. No lactation. Resting phase (moderate estrin effect) at fifth week post-partum.

These observations suggest that frequently there occurs an incomplete progestation of markedly dilated glands which appears to be associated with a relatively short, low progestational basal temperature curve. Moreover, the frequent prolongation of menstruation is associated with either

this hyperplasia of proliferative endometria or incomplete progestation.

Figure 1 illustrates a resting phase correlated with relatively constant low basal temperatures. Figure 2 is from a patient who lactated four weeks and appears to have ovulated at eight and

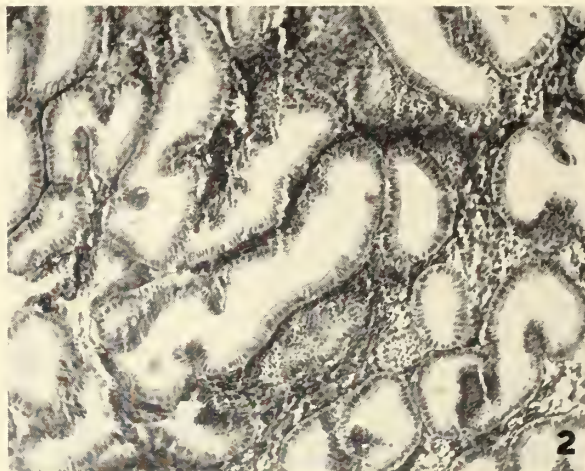


Fig. 2.—J. W. Lactated four weeks. Sixth day of progestational phase (22nd day of a 25-day cycle) at the 12th week post-partum.

twelve weeks post-partum. The endometrium was taken on the sixth day after the presumed ovulation and shows slight progestation of dilated glands. Figures 3 and 4 are from the same patient (D.S.) taken at eight and eleven weeks respectively. Progestation is slight but sufficient to confirm the basal temperature rise indication of ovulation.

Charts 1, 2, 3 and 4 illustrate ovulatory cycles following varying lengths of lactation. The cycle pattern, length of menstruation and time of ovulation are examples typifying the average patient's records.

The non-lactating puerperal cycle, which starts with menstruation at about eight weeks post-

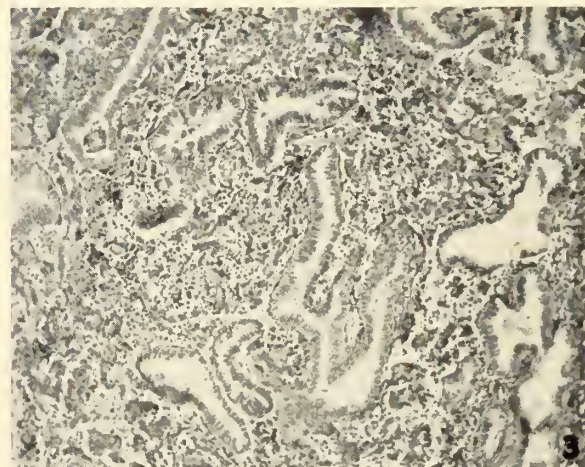


Fig. 3.—D. S. First day of menstruation at eighth post-partum week of a non-lactating woman. Deficient progestation and menstrual autolysis.

partum, has a characteristic tendency to be prolonged. When ovulation is first resumed, it tends to occur late in the cycle and the progestation phase seems shortened, with a greater tendency to menorrhagia than in normal cycles of the same individual. However, of the two changes, prolongation is usually more marked than the increase in the volume of flow.

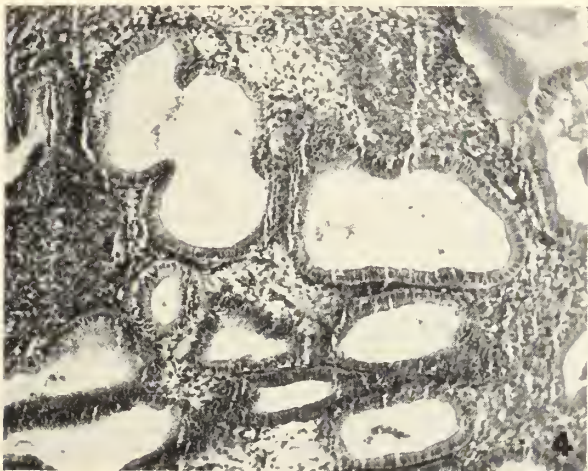


Fig. 4.—D. S. No lactation. Deficient progestation in same patient as Figure 3, taken on day 22 of a 24-day cycle at 11th week post-partum.

During subsequent cycles the corpora probably resume a quantitatively normal function as reflected by successively improved progestational endometrium, shorter cycles, earlier ovulation, less menorrhagia, increased basal metabolism, and longer progestational phases of the cycle.

Anovular menstruation, which constitutes the initial bleeding in about 95 per cent of the non-lactating group, tends to be more prolonged than after ovulation has appeared. There seems to be an inverse correlation between the length of the progestational phase and the average duration and intensity of uterine bleeding.

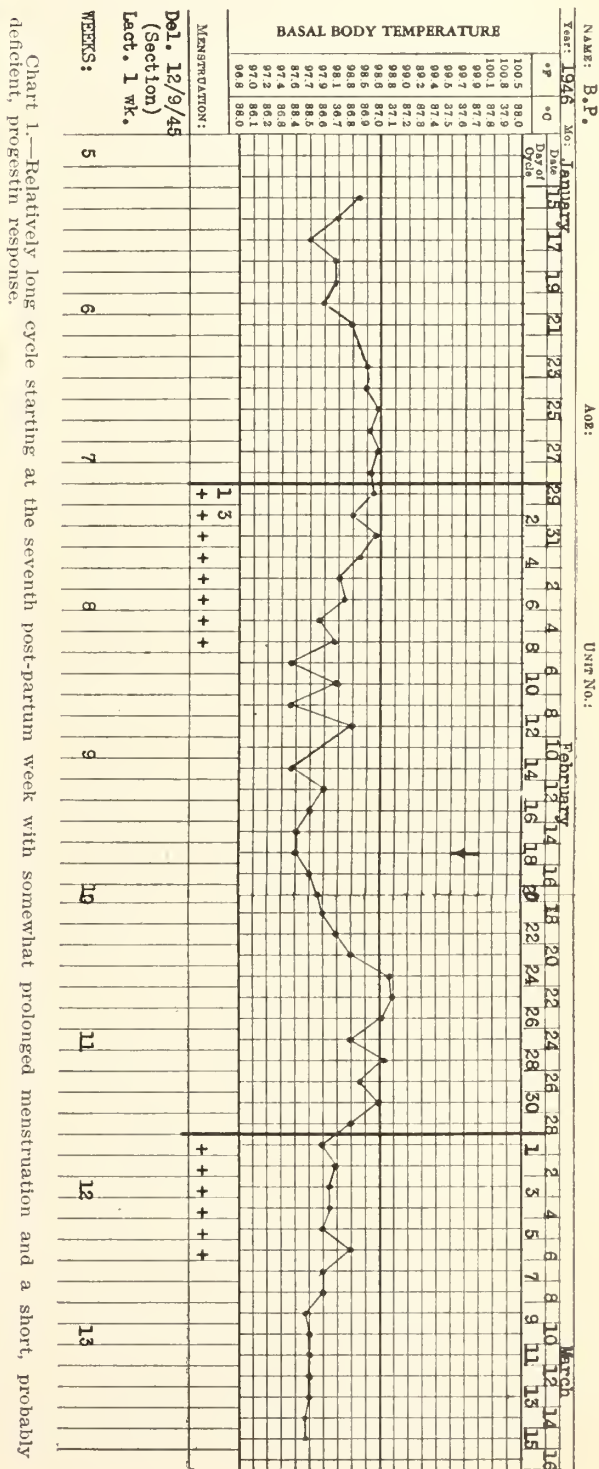
When menstruation occurred relatively early during the puerperium, especially in the non-lactating woman, the cycle tended to be irregular or prolonged and the menstruation which accompanied these cycles also tended to be more than six days' duration. The actual blood loss was not ordinarily great, despite the tendency to menorrhagia. This refers particularly to the anovular cycle. When ovulation occurred the cycles followed the characteristic pattern for that individual. When an ovulatory cycle was prolonged, the time of ovulation was ordinarily late in the cycle.

In general, the basal body temperatures were lower during the puerperium and continued so until about the time of the initial ovulation. This could derive from a puerperal lowering of the metabolism. Further points suggesting decreased metabolism were, the relatively low basal temperatures found during lactation, slowness of the pulse, sensitivity to cold, the readiness of fatig-

ability, low reserve of strength, and the relative promptness with which menstruation and ovulation recur when pregnancy or lactation is terminated at any stage. Moreover the fluctuation in basal temperature from day to day during the puerperium seemed to be more extensive than in the regularly ovulating cyclic woman.

DISCUSSION

From the functional viewpoint, during the puerperium there is a gradual preparation of con-

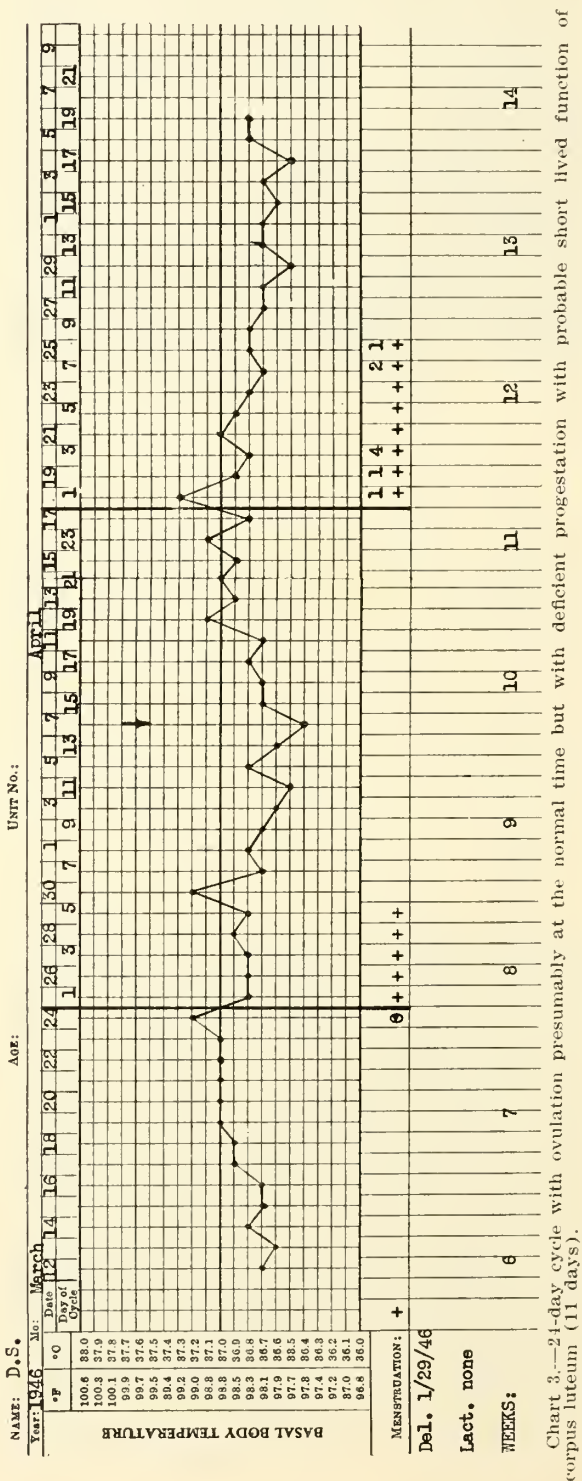
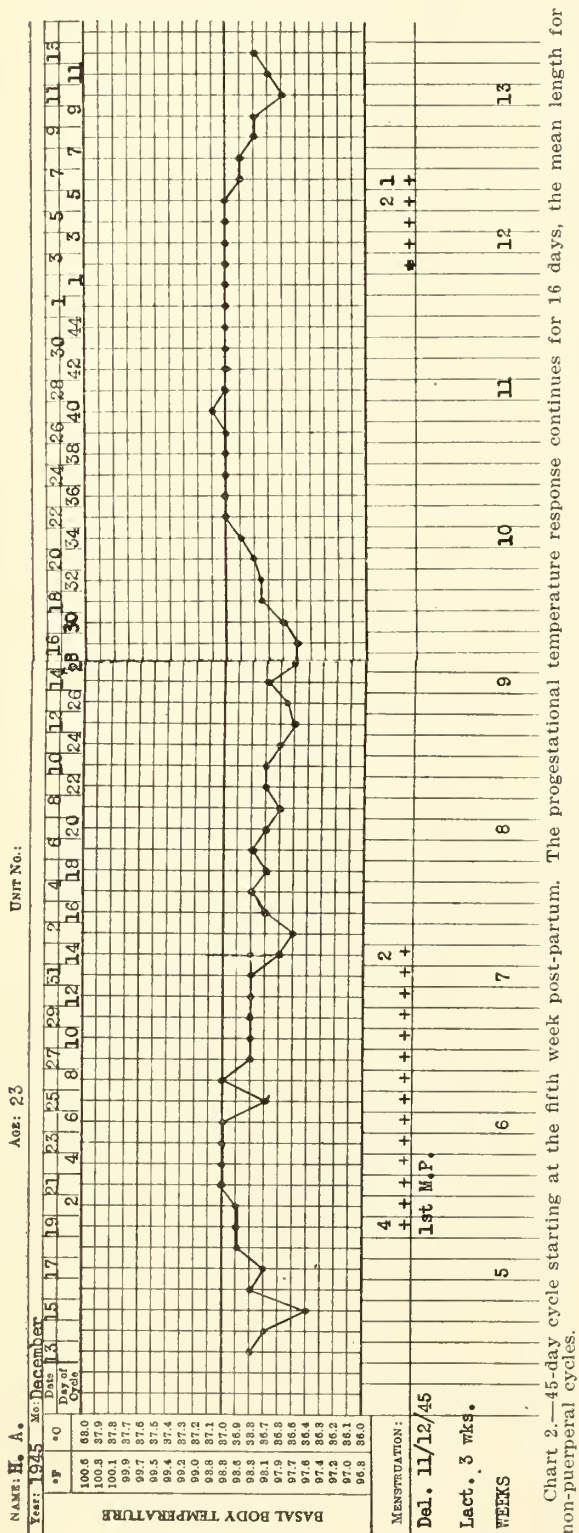


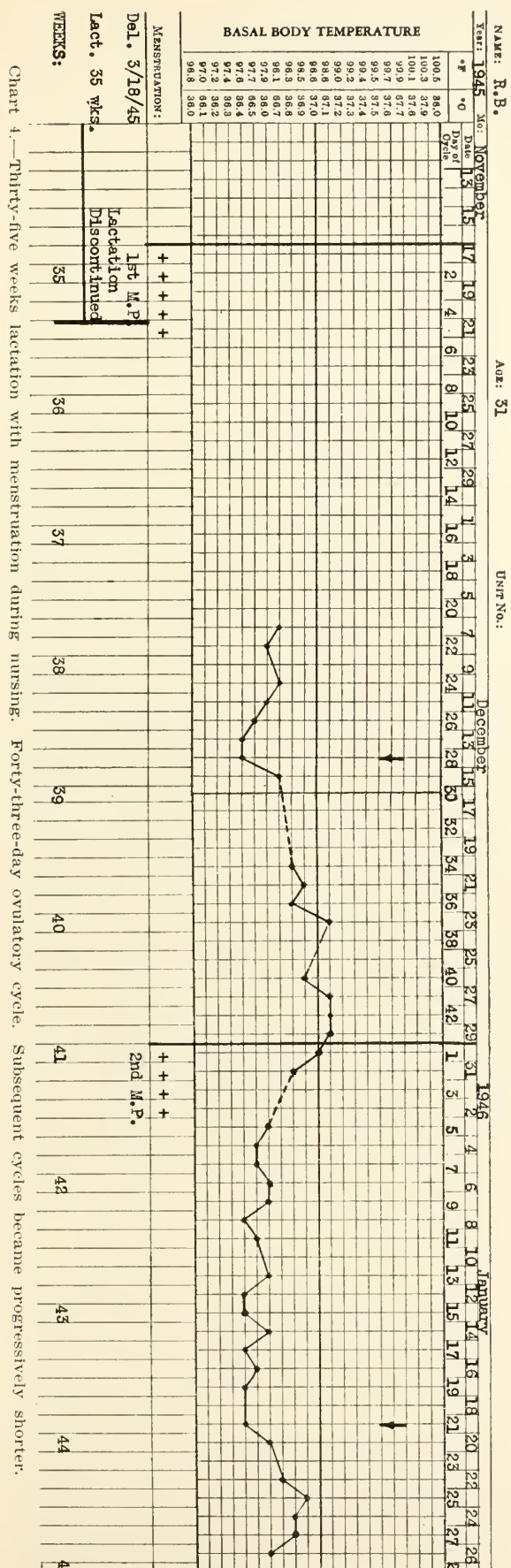
ditions favorable to a subsequent pregnancy. These seem to be brought about somewhat more promptly in the non-lactating patients, but even here there is a considerable delay during which at least the endometrial elements proliferate but slightly.

Those patients who have low metabolism tended to ovulate later and also had more difficulty in

continuing lactation. In some instances the failure to lactate seemed to be associated with other factors, probably of endocrine origin, such as a persistent anovular amenorrhic state. Patients in this category had symptoms of varying degrees of a hypophyseal disorder (resembling on the one hand Shehan's disease and Frömel's disease on the other).

Menstruation tended to occur in the presence





of lactation after the third puerperal month, and conversely, prior to the third month post-partum, lactation almost always ended before menstruation occurred. Also, after prolonged (over three months) lactation, ovulation ordinarily precedes menstruation. However, the non-lactating and short-lactating patients regularly develop anovular menstruation prior to their initial puerperal ovulation.

Those who menstruate during lactation frequently also ovulate,⁴ the conditions which cause the inhibition of the gonadotrophins being improved sufficiently to permit menstruation and subsequently, with less suppression, ovulation. On the other hand non-menstruating lactating women very rarely ovulate as in these, inhibition of the gonadotrophins is relatively complete.

While the nursing woman tended to have the first ovulation within a month of the cessation of lactation, it was deferred until about ten weeks post-partum in those not lactating. Thus the effect of recent pregnancy (apart from the effect of lactation) tended to inhibit the initial ovulation.

CONCLUSIONS

1. The puerperium is marked by temporary secondary ovarian failure which gradually improves, ordinarily culminating in the return of normal ovarian cycles.
2. Menstruation of the anovular type regularly precedes ovulation in the early puerperium, less frequently in the late puerperium.
3. The basal temperature method correlates satisfactorily with endometrial biopsies as a method of estimating ovulation in the puerperal woman.

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The Use of Penicillin in Non-Gonococcal Infections of the Urogenital Tract*

HENRY M. WEYRAUCH, M.D.,† *San Francisco*

SUCH brilliant clinical cures have attended the use of penicillin in the treatment of gonococcal infections that the early attention of urologists was directed chiefly to its application in these conditions. So long as the supplies of the drug were limited, it was natural that they be allotted to combat infections that proved readily susceptible. It has been only during the past year that sufficient quantities have become available for a comprehensive clinical appraisal of its value in non-gonococcal infections of the urogenital tract.

The response to penicillin in the non-specific urogenital infections is not so uniform as in the gonococcal infections but there is nevertheless a definite application in which the drug has proven spectacular. It is my purpose to discuss the use of penicillin in these urological conditions, indicating in broad general outlines how they may be recognized and how treatment should be carried out.

One of the cardinal principles governing the use of penicillin is to limit its application to pathogens which are susceptible. In some infections of the urogenital tract a bacteriological diagnosis cannot be made. In epididymitis or perinephritis, for example, there may be no involvement of the urinary passages or discharge of purulent exudate from which organisms can be recovered. One must then depend upon the clinical features of the case in assuming the type of the invading organism or use the drug empirically in order to determine its effect.

By now it is well established which bacteria are susceptible to penicillin and which are not. The most common penicillin-sensitive organisms encountered in non-specific urogenital infections are the streptococci and the staphylococci. Except for slight variations it is found that the beta hemolytic streptococci are very sensitive to penicillin. Streptococci viridans are moderately resistant and streptococci fecalis are still more resistant. The staphylococci are all more resistant than the streptococci as a group but practically all are susceptible to large therapeutic dosages. The pneumococci and the clostridium gas forming bacilli are penicillin-sensitive organisms less commonly seen in urologic practice.

BACTERIA DEVELOP LITTLE RESISTANCE

If a group of organisms is sensitive to penicillin, one rarely encounters individually resistant strains. Furthermore, bacteria do not develop any

appreciable degree of resistance to penicillin while treatment is going on. In sulfonamide therapy, on the other hand, different strains of the same organism present wide variations in sensitivity and it is characteristic for bacteria which are originally sensitive to develop remarkable resistance to the sulfonamides during the administration of the drug.

Unfortunately the large group of gram negative bacilli which are common invaders of the urogenital tract are all refractory to such concentrations of penicillin as it is possible to attain in the blood and tissues. As a matter of fact, some of these bacilli are not only resistant to the drug but they actually destroy its effectiveness against other bacteria within very short periods of time; that is, within 12 hours or less.

Penicillin has been found to be ineffective in practically all virus infections. This is interesting from a urological point of view in that some observers are of the opinion that the abacterial infections of the urinary tract, which have attracted considerable attention during the past few years, are caused by a filtrable virus. I have observed over 15 cases of acute abacterial posterior urethritis and cystitis treated with 800,000 or more units of penicillin without a favorable response being elicited in any of the patients.

If it were purely a matter of determining whether or not a patient was suffering from an infection caused by a penicillin-sensitive pathogen, the treatment of the non-specific urogenital infections would be a simple matter. Such is not the case, however, for many non-specific infections of the urogenital tract from which penicillin-sensitive organisms are recovered, have proven refractory to the drug. In general it may be stated that penicillin has proven less satisfactory in infections of the urethra and seminal tract than in infections of the kidney and perinephric space. Some of the reasons for this apparent discrepancy have become obvious, others remain obscure.

MORE EFFECTIVE IN ACUTE INFECTIONS

Hobby⁴ and Dawson's experiments partially explain these clinical observations. They found that penicillin is most effective when rapid multiplication of bacteria is taking place. They noted that conditions which increase the rate of growth of bacteria, increase the rate at which penicillin acts. Conversely, conditions which decrease the rate of growth are found to decrease the rate at which penicillin acts. Reduced to simple clinical terms this means that penicillin is more effective in the acute infections than in the chronic, as has proven true in the treatment of infections in all parts of the body.

* Read before the Section on Urology at the Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

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This explanation helps to account for the fact that penicillin has proven useless in all cases of chronic non-gonococcal urethritis, epididymitis, prostatitis and seminal vesiculitis despite the fact that streptococci and staphylococci are the invading organism in many instances. It does not account for the poor response to penicillin in acute non-gonococcal urethritis, epididymitis, prostatitis and seminal vesiculitis. From a theoretical standpoint acute coccal infections of these organs should respond as promptly as similar infections in the kidney and perinephric space. Yet cumulative clinical evidence does not support this theory.

How can one explain the more favorable action of penicillin on renal infections? One obvious answer is that such large quantities of penicillin are excreted by the kidney that it is possible to obtain a greater concentration in the kidney than in other tissues of the body. Helmholtz³ and Sung have demonstrated that in the presence of normal renal function, 50 per cent of the injected daily dose is excreted in the urine. This may provide a partial explanation but it does not reconcile the difference in response between acute perinephritis on the one hand, and acute epididymitis or prostatitis on the other. If the concentration of the drug in the kidney were the sole factor, one would have to hypothesize that all perinephric infections are secondary to a primary infection in the kidney or that lesions which are presumed to be a perinephritis are in reality acute coccal infections of the kidney.

APPLICABLE METHODS

Having outlined the theoretical aspects, let us proceed to the practical considerations concerning the application of the drug. Most non-specific bacteria seen in urologic practice are so resistant that intramuscular administration provides the only satisfactory method of giving sufficient quantities of the drug. The efficiency of oral penicillin is so low that only one-fifth to one-tenth of the amount given is absorbed. We first believed that penicillin was destroyed by the acid in the stomach but later work indicates that the difficulty lies in the failure of absorption by the intestinal tract. It is difficult to impossible to obtain a high concentration by oral administration, to say nothing of the prohibitive cost. The intravenous route is unsatisfactory because it is followed by too rapid excretion and produces local irritation of the vein. Preparations in beeswax and oil reduce the need for frequent injections but they do not maintain as constant a blood level as injections of an aqueous solution every three hours. Three hours has been found to be the optimum time interval for intramuscular injection since the blood level falls rapidly thereafter.

There are no absolute rules governing the dosage of penicillin. In determining dosage, one must be guided by the sensitivity of the organism and the response of the patient. The sensitivity of the organism is indicated by its type but is more accurately assessed by in-vitro tests.

At present, four of the fractions of penicillin

recognized have been designated as G, F, X, and K. They are found in varying proportions in different commercial preparations. The biochemical properties of each fraction are only partially understood but it has been found that some organisms yield to one and not to another. This explains why some brands or lots prove effective in certain cases while others fail, and indicates that it may be valuable to test the sensitivity of an infecting organism to various preparations.

Most commercial preparations now contain a large proportion of penicillin K, usually about 50 per cent. Penicillin K apparently possesses the least antibiotic activity of the four fractions. Although it shows effectiveness in in-vitro tests, penicillin K is rapidly inactivated in the body. Producing companies are studying the problem and are attempting to improve the effectiveness of penicillin by increasing the content of penicillin G, one of the most potent forms. They are also seeking additional unknown fractions which are possibly being destroyed during the purification process. Until newer products become available, we can increase the concentration of the smaller fractions by increasing the total dosage being administered.

DOSAGE

For bacteria which are readily susceptible to penicillin the dosage should be from 100,000 to 200,000 units per day. In the serious infections it should be from 300,000 to 400,000 units per day. Usually maximum therapeutic concentration can be attained by giving 50,000 units every three hours, a total of 400,000 units per day.

It is a well known therapeutic axiom that if one gives a drug it is essential to administer it is sufficient amount to obtain a satisfactory therapeutic response. There is no difficulty in applying this rule to penicillin, for while there is no other known chemotherapeutic agent which is so powerful against bacteria, there is none which is so harmless to the host. This makes it possible to give enormous dosages without danger to the patient. In acute, fulminating infections, therefore, if the patient fails to demonstrate a prompt response the dosage should be increased at once. In the chronic infections, likewise, as soon as it becomes apparent that the patient is showing no improvement it is advisable to give larger amounts.

I will now briefly discuss the specific treatment of the various conditions which confront the urologist.

In acute perinephritis the patient should be started on not less than 25,000 units of penicillin every three hours as soon as the diagnosis is made. If, within 24 to 48 hours, there is no clinical improvement the dosage should be increased to as high as 50,000 units every three hours. In most instances there will be a dramatic response by the first or second day of treatment. In some patients the temperature falls by crisis, in others by lysis. If there is no improvement by the end of one week the chances are that a perinephric abscess has developed and that no amount of penicillin will remove the necessity for the surgical

drainage which is indicated. In eight cases the only patient who failed to respond had a large perinephric abscess.

The same dosage schedule applies to acute coccal infections within the kidney and the same response is to be anticipated. I have treated five cases successfully. It is extremely important to study the upper urinary tract in all patients with renal infection in order to rule out the possibility of a calculus, hydronephrosis, carbuncle or other condition which requires surgical intervention. This study should be delayed until the acute phase of the illness has been controlled, unless the patient fails to improve or grows worse when prompt investigation becomes imperative. Sometimes a plain x-ray shows the presence of a calculus, information that is of value in the further conduct of the case. In the presence of obstruction it is wise to treat the patient conservatively by draining the kidney with a ureteral catheter until the acute infection subsides. If this is impossible or proves inadequate, emergency operation is indicated.

Shearer,⁵ Wiper and Miller report one case of renal carbuncle caused by hemolytic staphylococcus aureus which they treated successfully with penicillin combined with incision and drainage. The patient received a total dosage of 2,800,000 units over a period of two weeks, combined with an unstated amount used to lavage the abscess cavity. This experience indicates that it may no longer be necessary to resect or remove the kidney in renal carbuncle. It is reasonable to suppose that, if a coccal infection of the kidney is treated with penicillin sufficiently early, a carbuncle will not develop. In the case cited the patient had been having symptoms for two months and although he had been given a course of sulfadiazine he received no penicillin prior to operation.

After the acute febrile phase of a renal infection has subsided, therapy should be continued for several days. In the usual uncomplicated case the total dosage should be at least 2,000,000 units. Every effort should be made to prevent recurrence and to eradicate the infection before the stage is reached when the cycle of chronic disease becomes self-perpetuating.

PROLONGED PENICILLIN THERAPY

Once a chronic pyelonephritis has become established the prognosis for complete cure is poor. I have treated six cases of chronic staphylococcal pyelonephritis with penicillin for periods up to two weeks. In every patient the bacteria disappeared from the urine on dosages as low as 80,000 units per day but within a few weeks after cessation of treatment they invariably recurred. The danger of progressive secondary renal atrophy from a chronic pyelonephritis is so serious that I believe we are justified in placing these patients on really prolonged penicillin therapy, that is, to keep them on continuous administration for periods of six months or a year. In these cases the dosage required to keep the urine free of bacteria is usually so small that it should be possible to give adequate amounts by the oral route.

Penicillin sometimes proves valuable in mixed infections, for the body tissues may be able to control the infection after penicillin has eliminated the susceptible organisms. I found this to be true in a case of acute pyelonephritis of *b. coli* and hemolytic staphylococcus aureus etiology. Although the patient showed no improvement on large doses of sulfathiazol, when this was discontinued and the patient placed on penicillin there was immediate improvement. In other cases, either exclusively coccal or of mixed bacillary and coccal etiology, combined therapy, using both penicillin and one of the sulfonamides, may prove more effective than either drug used alone.

As concerns infections of the lower urinary and genital tracts, Thompson,⁶ in 1944, reported a high incidence of improvement following one or two courses of 100,000 units of penicillin in the following non-specific lesions: 36 cases of urethritis, 30 of chronic prostatitis, four of acute epididymitis. As nearly as I can determine, no other urologist has observed such remarkable results in any of these conditions, certainly not with such small dosages of the drug.

This year Cooper¹ and MacLean report that 75 of 100 patients having chronic non-specific urethritis and prostatitis were cured upon two weeks' treatment with penicillin combined with prostatic massage. Their dosage schedule consisted of 2,800,000 units of penicillin given over a period of two weeks. All patients received at least one course. Some received two. Since these patients received additional forms of therapy such as prostatic massage, urethral dilatations, and endoscopic applications; since chronic urethritis and prostatitis are frequently subject to spontaneous remission, and since the criteria of cure in these conditions is far from clear-cut I am still not convinced that 2,800,000 units of penicillin, or double this amount, will produce any consistent improvement.

In my own experience I failed to note any beneficial response to penicillin in 35 cases of non-specific urethritis. These patients all had a urethral discharge produced by a staphylococcal or streptococcal infection in either the acute or chronic stage. They all received from 600,000 to 1,000,000 units of penicillin without any other form of therapy.

DIAGNOSTIC TEST

The failure in these cases has been so uniform that in awaiting culture reports in urethritis of questionable etiology one can rely, for all practical purposes, on the administration of penicillin as a therapeutic diagnostic test. A course of 200,000 units will elicit a prompt diminution or cessation of the urethral discharge produced by the gonococcus but can be depended upon to have no effect upon a non-gonococcal urethritis, either abacterial or non-specific. In a gonococcal infection complicated by secondary invaders, some improvement is usually noted although a prompt cure does not always result.

I believe that our experience has been sufficient to prove that any form of penicillin so far de-

veloped is useless in non-gonococcal urethritis. It is now my practice never to give penicillin in a non-specific urethritis unless the diagnosis is questionable. In these cases it may be worth while to give a course of 200,000 units.

My results in acute non-specific prostatitis and epididymitis have been more encouraging. Of eight cases of acute prostatitis, two showed improvement; of ten cases of acute epididymitis, three were improved. In all the patients showing improvement, staphylococci were recovered from the urine. I am convinced that the dosages in this series of cases, ranging from 160,000 to 800,000 units, were too small. Acute lesions in the epididymis and prostate apparently represent very resistant infections and I am anxious to see if these results cannot be improved by giving 50,000 units of penicillin every three hours up to a total dosage of 3,000,000 to 4,000,000 units.

In eight cases of chronic prostatitis and two of chronic epididymitis no improvement was noted in dosages of from 160,000 to 1,000,000 units.

Penicillin has proven invaluable in the treatment of postoperative wound infections. When cocci are the invading organism, experience has shown that if the drug is started at once the wound will not break down and healing will be prompt. Usually 200,000 units of penicillin a day is a sufficient dosage. I was particularly impressed with one case of a severe, diffuse hemolytic staphylococcus aureus wound infection following an orchidopexy I performed with cotton suture material. Not only was healing rapid and complete but not one of the sutures sloughed out.

The use of penicillin should improve our results in plastic operations on the penis and urethra and in muscle transplants. Cordonnier² states that he has been able practically to eliminate infection in the repair of hypospadias by the combined use of sulfadiazine and penicillin both pre- and post-operatively.

A danger incident to the use of penicillin is that too much reliance may be placed in the drug, leading to the neglect of careful diagnosis and observation of the patient. While being a valuable adjunct to treatment, penicillin does not take the place of well timed surgical procedures, transfusions, serums, antitoxins and proper medical measures. It is the responsibility of the urologist

to recognize such complicating factors as poor urinary drainage, the presence of calculi, the development of abscesses, and to treat these conditions as indicated.

In summary it may be said that while the most dramatic results have been obtained in the acute infections, good results may be possible in some chronic infections by more prolonged treatment. Regardless of the lesion, the guiding principles of treatment are to begin penicillin early, to give it in adequate amounts and to continue therapy until the body has destroyed all causative organisms. By starting treatment early it is possible to prevent irreparable damage and to avoid the development of irreversible pathological changes. By continuing treatment for a long time after the febrile reaction has subsided, one prevents recurrences and the development of residual chronic infection.

SUMMARY

Although the value of penicillin in treating gonococcal infections has been well established, considerable obscurity still exists as concerns the use of this drug in non-gonococcal infections of the urogenital tract. The subject is discussed, differentiating those urological lesions which are susceptible from those which are not. Certain principles of treatment are evolved, on the basis of the type and location of the infection, the infecting organism and the effective dosage.

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The Trend of Medicine and Its Relationship To the Prevention of Disease*

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BEFORE the time of Hippocrates, the practice of medicine was a matter of objective diagnosis, and during its early evolution some emphasis was placed on therapeutics. Subsequently attention was directed toward refinements in diagnosis, and by the twentieth century, diagnosis had become a relatively precise science. Ultimately therapeutics also became reasonably accurate, based as it was upon better knowledge of anatomic change and compensatory physiologic adjustment. In both circumstances the emphasis was placed on man in an abnormal state of health.

Today more is demanded of the physician than an interest in disease alone, for the practice of medicine transcends both diagnosis and therapeutics, which by themselves do not answer the modern challenge. At present it is demanded that the physician expend more effort toward the prevention of disease, thereby placing emphasis on understanding those factors which maintain man in equilibrium with his environment, rather than on those which precipitate illness. The physician is compelled to recognize the importance of the interaction of those situations which impinge upon and affect the equilibrium between man and his surroundings. Physicians of necessity must become philosophical biologists in order to have the maximum comprehension of the trend of medicine.

Unfortunately the curricula of modern medical schools have been over-burdened with the techniques of specialization and the minutiae of the sciences ancillary to medicine, and for that reason the more important subject of ecology has been excluded.

Because of the scientific advances in the conservation of health, more persons are allowed to live today than could have hoped to have survived a century ago. As a result the need for physicians with a philosophic viewpoint of biology becomes imperative. What crimes are committed under the license of science! One thing is certain, we shall perish or lose our leadership in direct proportion to our ignorance of those immutable laws which govern the actions and reactions of the human organism as it seeks to express itself in its environment, whether that be biologic, social, economic, or psychologic.

The categorical statement can be made that the

vocation of the physician should be the study of human beings seeking adjustment in their environments, his *avocation* the study of disease in individuals and in populations. The physician's vocation, then, impels him to study human ecology. In its essential nature ecology is the observation, enumeration, testing and synthesis of whatever can be known about life and environment, in order to interpret the relationships existing between them in practical terms.

An inquiry into the chain of events that makes the independent human being totally dependent in time and space upon his environment is of necessity an inquiry into human ecology. In fact, the human subject is absolutely dependent upon the most minute and apparently insignificant factors of his environment. He is a part of all he experiences, and disease is often the folly of an avoidable, unpleasant experience. If the physician were to know what elements of the external environment condition the human subject both qualitatively and quantitatively, he would be better prepared to assess the defense reactions of the internal environment, and thereby understand more fully the mechanisms of the production of disease in the individual.

How can a man be advised and treated for an internal, physiologic adjustment to an aberrant external stimulus if the physician fails to appreciate or is unaware of the part which environment and habit plays in the life of man? The physician should strive to know more about normal man, so that he will be able to understand the subtle factors which lead to devitalization and ultimate illness. Often in the search for the specific cause of disease, contributing elements such as psychologic conditioning, avoidable social pressures, insufficient leisure, poor nutrition, and other inevitable ecologic factors are overlooked.

One of the most important of these is the study of nutrition. Either too much or too little food may produce illness, and the intelligent application of the proper dietary regimen may cure it. Through application of the principles of good nutrition, emphasis is automatically placed on keeping man well. The expert in nutrition can advise what to eat, and why it should be eaten, but until the part which poor nutrition plays in the etiology of disease is appreciated, recognized and understood, this important causative factor of devitalization cannot be successfully combated or prevented. There is much hidden hunger in our land of plenty, much devitalization that goes unheeded, and much disease that is unrecognized.

The time for a careful re-evaluation of the need for prevention of disease is imminent. Diag-

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nosis and treatment without prophylaxis and prevention are indeed sterile. What the physician of the future needs is a more than passing acquaintance with biology and a quickened interest in the study of human ecology. What more practical step toward the solution of this dilemma could be designed than the establishment of an Institute of Human Nutrition where the practicing physician could become acquainted with the interaction of agricultural, biologic, geographic, economic, sociologic and psychologic situations which comprise and condition the equilibrium existing between the external and the internal environments of man. The physician must appreciate that medicine in all of its ramifications is a social science, and that his services to society should be consonant with this thesis. A life in which human conservation becomes the major goal should be

the purpose of all of our activities. Any individual who is needlessly wasted or neglected constitutes not only a preventable loss, but an affront to human dignity and a negation of the principle of a free and democratic society.

In summarizing these discursive remarks on the trend of medicine and its significance to the physician, the conclusion is evident that the prevention of disease is assuming greater proportion in our modern world and that the subject matter of diagnosis, treatment, and the prevention of disease should have at *least* equal emphasis in the medical curriculum. Within the field of prevention the theme of human ecology should permeate its entire philosophy, and a first step toward this ideal could be achieved by means of a thorough exploration of the subject matter of nutrition in its relationship to man.

The Clotting Mechanism and Tests For Its Efficiency*

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ANYONE who has attempted to review, even most superficially, the literature on the subject of coagulation must be impressed by the tremendous amount of effort that has been expended in the attempt to solve this problem. Theories and more theories have been proposed and arguments between the proponents of the theories have waxed long and loud. Now the modern concept of the clotting mechanism may be presented in its simplest terms as follows:

Thromboplastin + prothrombin + calcium = thrombin. Thrombin + fibrinogen = fibrin. This is our classical theory and is the best working hypothesis that we have. Yet even it does not explain all the problems of the coagulation mechanism, nor do all investigators accept it, at least not in this simple form. It is, of course, this skepticism that stimulates investigation and adds to our knowledge, but in this brief review we cannot discuss fully the disputed points.

What are these substances which we consider essential in this process? Thromboplastin has never been isolated and purified and we know it better by its activity than by any other of its properties. We know that it is a substance which occurs in platelets and in many tissue cells, and we know that it is essential for the conversion of prothrombin to thrombin. It does not occur in circulating blood or at least not in significant amounts. It is set free when platelets disintegrate from any cause, or when tissue is damaged. It is

quite stable when exposed to heat and for that reason it probably cannot be considered to be an enzyme.

Prothrombin is thought to be a protein containing a considerable amount of carbohydrate. It is produced by the liver, possibly to some extent by other tissues. That the liver is the most important source can readily be shown experimentally by causing damage of the liver, following which the prothrombin content of the blood rapidly decreases. For its production, there must be available to the liver an adequate supply of natural Vitamin K or a satisfactory methyl naphthoquinone derivative. The prothrombin of the newborn may be normal or below normal at birth, but regularly the level falls for a few days usually returning to normal by the end of the first week when the intestinal bacterial flora becomes established and produces Vitamin K. If the level falls too low, hemorrhagic disease may occur.

Thrombin results from the activation of prothrombin by thromboplastin in the presence of calcium. It has been shown that a fixed amount of prothrombin yields a constant amount of thrombin, irrespective of the excess of thromboplastin added. Thrombin has been shown to be a protein which also contains carbohydrate. While there is no doubt that calcium is indispensable in the conversion of prothrombin to thrombin, there has been much disagreement as to the role that it plays. It is, of course, by the addition of such substances as the oxalates and citrates which remove or fix the calcium of the blood that clotting is most frequently prevented in blood withdrawn for the purpose of investigation or for trans-

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fusion, yet it is known that considerably more oxalate must be added to blood than is sufficient to precipitate the free calcium in order to prevent coagulation. This suggests that calcium may be in combination with prothrombin and that the excess of oxalate may be necessary to release it from this substance. Thrombin certainly does not contain calcium.

The rate of coagulation depends upon the concentration of thrombin and by the same token upon the concentration of prothrombin present before its conversion to thrombin. The manner in which thrombin changes fibrinogen to fibrin is like an enzymatic or catalytic action. Thrombin does not combine with fibrinogen and it has been shown that a purified preparation of thrombin is able to convert over 200 times its weight of fibrinogen to fibrin. After coagulation of blood a high concentration of thrombin is present in serum but this thrombin activity rapidly disappears. Yet, by appropriate methods, it can be re-activated which suggests that it combines with some other serum constituent.

We should not forget that certain changes take place in the clot after coagulation. The clot contracts and this process can be observed best when the blood is allowed to coagulate in a test tube. When the clot contracts, serum is expressed. This phenomenon appears to be due to the presence of platelets which become adherent to the strands of fibrin and in some way cause them to bend and distort. As is well known, a great reduction of platelets in blood destroys the ability of the clot to retract. In addition to this role and that of furnishing thromboplastin, the platelets play an important role in intravascular clotting. Indeed, the platelets initiate thrombosis by attaching themselves in large numbers, usually in clumps, to the point of damage of the lining of the blood vessel. As soon as they adhere to the damaged surface, they seem to become sticky and by this property appear to assist in attaching fibrin to the lining.

Fibrinogen is classified as a globulin. It is different, however, from the other proteins of the plasma, as is obvious when we consider its action when thrombin is formed in blood plasma. It appears to be formed in the liver. However, it does not decrease in the circulation nearly so rapidly in the presence of liver damage as does prothrombin. It is rare that there is sufficient variation in the concentration of fibrinogen to interfere with the process of coagulation. Calcium is even more rarely reduced to a level low enough to retard the clotting mechanism.

There are two procedures which are of the greatest importance in estimating the efficiency of the clotting mechanism. These are the determination of coagulation time and the determination of the amount of prothrombin present. While the determination of the bleeding time and the estimation of platelets are important in any hemorrhagic disease, they are not so directly concerned in artificial control of the clotting mechanism. There are many methods for the determination of the coagulation time, but probably the best for clinical

purposes is the one known as the Lee-White method, in which blood obtained by venipuncture is placed in the amount of 1 cc. in a small dry clean test tube 8 mm. in diameter. Ordinarily, two or three tubes are used and one or two of these are tilted every 30 seconds until a clot is formed which is sufficiently solid to allow inversion of the tube. The second or third tube acts as a control upon the one which is tilted. The blood should be kept at approximately body temperature. Normal blood varies in its coagulation time by this method over a fairly wide range, from six to fifteen minutes. The blood should be obtained by a clean rapid venipuncture and suction should be avoided. These precautions minimize the introduction of thromboplastin from the tissue.

When venipuncture is not feasible, probably the capillary tube method is next best. Here a capillary tube 1 mm. in diameter is filled with blood obtained by skin puncture. Every 30 seconds the tube is filed and a small piece is broken off. The end point is determined by the period at which a fibrin thread is seen between the separated fragments. The normal time is from three to seven minutes. This method is subject to the objection that by skin puncture, a considerable amount of thromboplastin is released and mixed with the blood. The determination of coagulation time is of greatest importance in the diagnosis of hemophilia and in the control of heparin therapy, otherwise the determination of coagulation time is of little value. I feel that an enormous amount of time is wasted in the clinical laboratory in the performance of this test.

For the estimation of prothrombin activity the method of Quick is most frequently used. It is simpler than the two stage method of Wamer, Brinkhous and Smith and more accurate than the so-called bedside methods. Briefly the steps in this procedure are as follows: 4.5 cc. of blood are obtained by venipuncture and are mixed with 0.5 cc. of 0.1M sodium oxalate. This prevents coagulation and this blood is then centrifuged and the plasma is used for the test. 0.1 cc. of the plasma is mixed with 0.1 cc. of thromboplastin in a small test tube and placed for one minute in a water bath at 37½° centigrade. Then, 0.1 cc. of 0.02M calcium chloride is added. The tube is first shaken, then gently tilted back and forth until the clot forms and the time required for the formation of the clot is determined by the use of a stop watch. One or more normal controls are always used and for accuracy every determination should be checked. The thromboplastin used is dehydrated rabbit brain. Quick says that the coagulation time of normal plasma by this method should be from 11 to 12½ seconds. This depends upon the use of an active thromboplastin, and it is in the preparation of the thromboplastin that many laboratories appear to have difficulty. At any rate, many are unable to produce a thromboplastin which will cause coagulation in 12½ seconds. However, a somewhat less active thromboplastin may be used and accurate results obtained.

Quick¹ describes a method for the determina-

tion of the potency of the thromboplastin when it is not up to the highest standard of efficiency.

TABLE 1

Concentration of prothrombin in plasma, %	Clotting Time	
	Undiluted plasma sec.	Diluted plasma* 50% sec.
100	11-12	15
97	—	15½
90	—	16
85	—	16½
80	12½	17
75	—	17½
70	—	18
67	—	18½
65	—	19
60	13½	19½
58	—	20
56	—	20½
53	—	21
50	15	21½
40	17	—
30	19½	—
25	22	—
20	25-26	—
10	37-40	—
5	55-65	—

* The plasma is diluted with an equal volume of physiologic saline solution.

The prothrombin time of the unknown plasma is determined and the theoretical percentage of prothrombin read from the table or graph. Normal plasma is diluted 50 per cent with physiological salt solution and its prothrombin time determined. This should be 15 seconds with an active thromboplastin, but if it is more than 15 and less than 22, its percentage activity can be found opposite the figure obtained in the left hand column. Thus, if the figure obtained with diluted normal plasma is 21.5, the thromboplastin is 50 per cent active. If the prothrombin time of the unknown is 22 seconds, the theoretical value of the prothrombin content is 25 per cent, but since the thromboplastin is only 50 per cent active, the actual value is 25 per cent divided by 0.50, or 50 per cent. Attempts to find a more stable thromboplastin than dehydrated rabbit brain, have been

made by many. Russell viper venom was found to have an active thromboplastic action, is quite stable and is used by many laboratories.

A relatively small prolongation of the coagulation time of the plasma by Quick's method indicates a considerable decrease in the prothrombin activity. This is shown by the well known graph prepared by Quick (Figure 1), as well as by the table above.

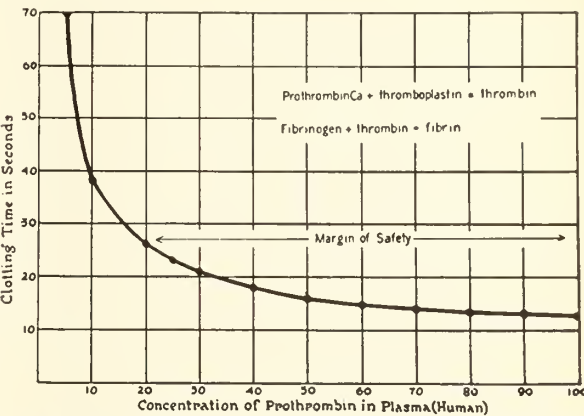


FIG. 1. Human prothrombin curve. The relation of the coagulation time of recalcified plasma (with excess of thromboplastin) to the concentration of prothrombin.

There is a wide range of safety as far as hemorrhage is concerned in the percentage reduction of the prothrombin activity and there is little danger of hemorrhage before the prothrombin is reduced to 20 per cent of normal. However, when the prothrombin level is deliberately reduced as by the use of dicumarol, effective levels for the prevention of thrombosis are readily reached before this danger point is approached.

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Delayed Reactions Following Penicillin Therapy*

PRELIMINARY REPORT

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AS penicillin has become more widely used, reports dealing with reactions occurring during its administration have appeared with increasing frequency.^{1,2,5,6,7,8,9} However, examination of literature has failed to reveal any detailed account of delayed reactions occurring after cessation of penicillin therapy.

It is the purpose of this report to describe seven cases in which reactions, varying in severity from mild to extremely severe, appeared at intervals of two to twenty-eight days after the last administered dose of penicillin.

REPORT OF CASES

CASE 1: A 49-year-old white male entered the hospital for penicillin therapy of latent syphilis. He had been known to have a positive Wassermann for the past 19 or 20 years, but he gave no history of primary or secondary lues. He had had sporadic mapharsen and bismuth therapy during the last five to six years, and both drugs had caused typical skin reactions. No history of asthma, hay fever or urticaria was obtained. Other than the positive Wassermann and Kahn tests, there were no other important physical or laboratory findings. Spinal fluid Wassermann test was negative.

He was given 3,000,000 units of sodium penicillin in divided doses intramuscularly over a period of seven days and was then discharged. His course remained uneventful until three days after the last injection of penicillin, at which time he re-entered the hospital because of intensely pruritic giant hives over the entire body. Symptomatic therapy with calamine lotion, calcium gluconate intravenously, ephedrine orally, and epinephrine intramuscularly gave the patient little relief. He became edematous over the entire body including head, palms and soles. By the third day, a gnawing epigastric pain appeared accompanied by nausea and vomiting. These gastrointestinal symptoms were promptly controlled by milk and alkaline water. The temperature went up as high as 40° C. The following day he complained of severe headache and neck stiffness, and became delirious. Urinalysis at the onset of this reaction contained one plus albumin but was otherwise normal. There was a slight leukocytosis of 12,000 with 90 per cent polys and no eosinophiles. Edema and urticaria slowly subsided and the patient became asymptomatic ten days after the onset of the reaction.

CASE 2: An 85-year-old white male with generalized arteriosclerosis and hypertension entered the hospital because of a septic sore throat. Physical examination revealed a moderately severe acute pharyngitis. On entry the white blood cell count was 10,000 with 74 per cent polys, 17 of which were stab cells. He was given 25,000 units of penicillin every three hours, and after two days of therapy a scarlatiniform eruption appeared over the

entire chest and abdomen. Penicillin treatment was continued for three more days in spite of the eruption, but was abandoned because of intense pruritus. A total of 1,295,000 units had been given. The patient was discharged three days later after the eruption and urticaria had completely subsided.

Four days after discharge the patient developed giant ecchymoses over the entire body. These were most pronounced over the injection sites on the buttocks and were also accompanied by intense pruritus. There was no leukocytosis, nor any reduction of hemoglobin or platelet count. Treatment was symptomatic and convalescence required three weeks.

CASE 3: A 50-year-old white male entered the hospital because of a low back injury with nerve root irritation in the lumbar region. A limited fusion of the lumbosacral area was performed and subsequently a superficial wound infection due to staphylococcus aureus developed. Healing was obtained after about 1,000,000 units of combined local and intramuscular penicillin, and he was discharged one and a half months after entry.

Approximately ten months later, a draining sinus developed in the central portion of the lumbar wound, and he was re-hospitalized. The old scar was excised, the tract traced down to a silk suture in the superficial fascia, and 20,000 units of penicillin was placed in the wound before closure. The patient was also given 15,000 units of penicillin intramuscularly every three hours for seven days, then decreased to 5,000 units every three hours for another day. He was discharged on the 19th hospital day.

The patient returned to the hospital four days after discharge, stating that giant hives had developed two days after cessation of penicillin therapy. On examination, advanced urticarial lesions were found over the body, scalp and extremities, and the hands and feet were markedly edematous. Urinalysis and blood count were normal. The patient died on the fourth hospital day of toxemia from a gas bacillus infection which developed 36 hours before death. The source of the infection was not determined.

CASE 4: A 30-year-old white male received 1,000,000 units of penicillin orally given every three hours for one week, for a chronic rectal fistula. Two days after cessation of therapy, giant hives appeared over both palms and then over the thorax and extremities. Markedly painful edema of both soles appeared and he was unable to walk. Temperature rose to 39.4° C. accompanied by dyspnea and palpitation. This reaction was moderately severe, but he was able to remain at home and recovered in two weeks with symptomatic therapy.

This patient gave no history of previous asthma, hives or eczema. He had received 15 injections of penicillin (dosage unknown) one year before with no untoward effects.

CASE 5: A 44-year-old white female was hospitalized because of a severe pruritus vulvae and ani. A total of

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540,000 units of sodium penicillin was given in 30,000 unit doses every three hours.

Twenty-eight days after the last penicillin injection, the patient had a sudden onset of severe pruritus and urticaria about the neck; these rapidly spread to the chest, abdomen, and extremities. There was also a severe "vice-like" headache, low mid-abdominal pain, and dysuria. She could not walk because of pain and swelling of the feet. During the first three days of the reaction the temperature ranged from 38.8° to 39.4° C. and complete recovery required two weeks.

This patient gave no history of allergic manifestations or previous penicillin therapy.

CASE 6: A 30-year-old white female was hospitalized for menorrhagia of two months' duration. A left salpingo-oophorectomy was performed because of tubal pregnancy. During the operation 500 cc. of whole citrated blood was given. On the eighth post-operative day she developed a left femoral phlebitis for which she was first given sulfadiazine without improvement, and then 2,760,000 units of penicillin intramuscularly over an 11-day period. Recovery followed and the patient was sent home on the 31st post-operative day. Seven days after penicillin therapy had been discontinued, she developed giant urticaria of the face, hands, arms, thighs, and back, with moderately severe pruritus. She was given ephedrine orally, and in four days she was asymptomatic. This reaction was comparatively mild. There had been no previous penicillin treatment but there was a history of asthma from infancy to the age of 14, with no allergic manifestations for the last 16 years.

CASE 7: A 29-year-old white male had been in good general health with no past personal or family history of allergy, urticaria, or arthritis. Sodium penicillin, in a total dosage of 400,000 units given intramuscularly every three hours over a three-day period, was instituted for a moderately severe purulent bronchitis accompanying an influenza-like infection. Prompt drop in fever from 38.8° C. to normal with clearing of purulent sputum occurred on the last day of therapy.

The patient rapidly became asymptomatic and remained so until nine days after the last dose of penicillin, when an abrupt onset of marked redness, tenderness, swelling and pain in the soft tissues about both wrists and the small joints of both hands was noted. Twenty-four hours later diffuse, intensely pruritic, giant urticarial wheals appeared over most of the body. Joint involvement then spread to both knees and shoulders, and tender 3x3 cm. deep subcutaneous nodules appeared adjacent to these joints. Mild hydrarthrosis of the left knee followed. The soles of both feet, and both dorsi and palms of the hands, became hot, painfully edematous, and redenned, and edema of the eyelids and posterior pharynx ensued. The temperature rose to 38.8° C., and the patient became quite incapacitated. There was a leukocytosis of 14,200, with a normal differential count, and the urinalysis was normal.

No relief was obtained from the usual measures, including oral ephedrine and amytal, multiple injections of 1:1000 epinephrine, and intravenous calcium gluconate. "Benadryl," 50 mgm. twice daily (oral), produced relief from pruritus but had no effect upon edema or joint pain.

Slow subsidence of joint swelling, redness, and tenderness with gradual disappearance of nodules and urticaria occurred. All signs and symptoms had completely disappeared ten days after the onset of the reaction.

COMMENT

As can be seen in the accompanying table, reactions were unrelated to the duration or quantity

of penicillin, and occurred after oral as well as after intramuscular administration. The one case

Case	Total Units Penicillin	Route of Administ.	Duration of Treatment	Interval be- tween last dose and onset of reaction
1.	3,000,000	Intramusc.	7 days	3 days
2.	1,300,000	Intramusc.	5 days	7 days
3.	900,000	Intramusc.	8 days	2 days
4.	1,000,000	Oral	7 days	2 days
5.	540,000	Intramusc.	2½ days	28 days
6.	2,760,000	Intramusc.	11 days	7 days
7.	400,000	Intramusc.	3 days	9 days

which reacted after oral therapy had received parenteral penicillin one year before. One further case we are aware of developed mild but diffuse urticaria seven days following the testing of a penicillin aerosol apparatus, with inhalation of an estimated 5,000 units. Thus it is likely that this route of administration, as well as oral and intramuscular routes, is not free from delayed effects. It is significant that the majority of these patients gave no allergic histories, and did not suffer from fungous "id" reactions.^{3,4} Reactions were considered severe in six out of the seven cases, producing systemic as well as local manifestations. Systemic reactions consisted of fever, prostration, gastro-intestinal symptoms, severe headache, mild leukocytosis and albuminuria. Local reactions varied with the severity of the process and consisted of diffuse giant urticaria, intense pruritus, scarlatiniform eruption, severe arthralgia, hydrarthrosis, ecchymosis, and the formation of tender deep subcutaneous nodules resembling those seen in erythema nodosum. One or several of these local manifestations could be seen in the same patient. The general picture in two cases resembled that seen during severe serum reactions.

Studies of penicillin sensitivity occurring during therapy, or on re-administration of the drug, seem to indicate that true allergy to penicillin does occur.^{8,9,2,1,3} Why the manifestations should be so long delayed, as illustrated by this report, requires further study.

It is not our purpose at this time to discuss in detail the possible mechanisms involved in these delayed reactions. However, we consider them striking enough to warrant description. Awareness of their occurrence with the possibility of one or more weeks of incapacitation demands circumspection before penicillin is prescribed for illnesses which would otherwise run a self-limited course.

SUMMARY

1. Seven cases of delayed reactions following penicillin administration are reported.

2. Reactions included urticaria, joint involvement, ecchymoses, gastro-intestinal and central nervous system manifestations. Severity of the reaction was not related to the amount or route of administration.

3. Delay in appearance of these reactions

varied from two to twenty-eight days after cessation of penicillin therapy.

4. Incapacitation resulting from the reactions averaged about two weeks.

5. Circumspection regarding use of penicillin in otherwise self-limited illnesses, and its reservation for use only in disease processes with well defined indications, is urged.

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DOCTORS REPORT TWO CASES OF RARE DISEASE CARRIED BY RATS

A new complication of a heretofore rare rat-borne disease, the first of its kind to be recognized in the United States, is reported in the August 17 issue of *The Journal of the American Medical Association* by three Rochester, N. Y., physicians.

They state that they treated two patients suffering from a kidney infection caused by leptospiral organisms which are carried by rats. This infection usually affects the liver.

The authors—W. W. Stiles, M.D., J. D. Goldstein, M.D., and W. S. McCann, M.D., from the Departments of Bacteriology and Medicine of the University of Rochester School of Medicine and Dentistry—state that "instances of this 'pure' renal form of leptospirosis are fairly common abroad, but prior to this report no cases have been recognized in the United States. The two patients observed in Rochester are the first confirmed instances of anicteric leptospiral nephritis to be reported in this country."

The first patient was a schoolboy, aged 17, who had symptoms of vomiting, diarrhea, headache, severe backache and a temperature of 103 F. He had been swimming almost daily in the Erie Barge Canal near Pittsford, N. Y., and although the canal was known to be infested

with rats he was not aware of any direct contact with the rodents. He was aware that water had entered the upper respiratory passages on several occasions. He was discharged from the hospital on the 19th day after the onset of his illness and remained in bed at home for an additional five weeks. The patient was treated with a high protein, salt free diet, and given a large amount of fluids.

The second patient was a dairy worker with the same general symptoms. The article points out that "for the past several years the patient had worked in a milk pasteurizing plant in Pittsford, N. Y. He said that rats were frequently seen about the plant and that approximately three weeks before this illness one of them had become caught in the mechanism of a bottle washer, and its macerated tissues had been thrown about and over him." Fever persisted until the 16th day of illness in this patient. He remained in bed two weeks at home after discharge from the hospital.

The infection was discovered in both instances after a total of 60 guinea pigs were used in testing the bloods of the patients. The guinea pigs are very susceptible to leptospira.



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EDITORIALS

Can We Predict the Therapeutic Effect of the New Radioactive Elements?

“CHILD flown across continent to get atomic treatment for leukemia—only to find deadly disease cannot be cured by radioactive bombardment,” is the gist of a recent article by United Press. With a tremendous and quite logical public interest in atomic developments, we can perhaps expect that such incidents which have occurred with fair regularity in the past will now make headlines even oftener. It is indeed stirring to the imagination of layman and doctor alike to consider that some of the radioactive isotopes which can now be produced in relatively large quantities in the atomic pile may prove the cure to hitherto hopeless diseases.

Has our experience so far been sufficient that we can predict the course that such treatment will take and its outcome in some diseases? The answer is an unqualified “yes.” It is now some ten years since radioactive phosphorus was synthesized in the cyclotron, and there has been a steady trickle of reports on the effect of radioactive isotopes in the treatment of leukemia and other malignant diseases ever since. Regarding the systemic effect of radioactive substances introduced intravenously or by mouth into the human being, we have known the answer for more than thirty years, for it was inevitable that investigators would try the effect of small doses of radium or radon on the entire organism, as well as apply relatively larger amounts to localized malignancies. Cameron¹ in 1915 classified the various methods of internal administration which ranged all the way from inhalation of radon containing steam to radium enemas. Then, as now, the idea seemed attractive that even a small dose of a substance with such concentrated power as radium might somehow produce a desirable effect.

The answer was not long in coming. Even if we had forgotten results of thirty years ago, the watch dial painters who pointed the tips of the radium-containing brushes with their lips gave an involuntary demonstration of the effect of radium

poisoning in the early part of this decade.⁴ Even earlier those of the gullible who responded to advertisements ballyhooing the beneficial effects of the waters from radioactive springs found out personally about radium poisoning the dangerous way.²

We have abundant information, therefore, to predict the systemic effects of radioactive substances introduced into the body.⁵ As is always true with radiation therapy, there is a destructive effect which is differential in character depending upon the growth characteristics of the various cells. The most rapidly growing cells are the first to succumb to effect of radiation. The blood cells are particularly vulnerable, and experiments using Phosphorus 32 in the control of leukemia have been conducted with a degree of success for more than ten years.³ Likewise, the “circulating tumors” of the blood stream which involve the red cells—polycythemia vera—respond to intravenous P-32. Edward H. Reinhard at the recent meeting of the American Association for the Advancement of Science, reports that P-32 in the treatment of polycythemia vera is “probably the best therapeutic agent at the present time.”⁷

Working at the Philadelphia General Hospital, Widmann⁶ recently reported a large series of leukemia patients treated by all the radiation methods now generally used. Whether he irradiated bone marrow or spleen or set the patient at a distance from the x-ray tube so that the entire organism could be “sprayed” he got the same result. In brief, there was no response in cases of acute leukemia, but the chronic cases responded by palliation of symptoms and a lengthening of life which Widmann adjudged to be about a year.

In a recent report to the American Radium Society and elsewhere, Dr. John Lawrence, who has worked for ten years with radioactive elements produced by the cyclotron, expressed the opinion that the therapeutic results were no better than those produced by x-ray.

It is entirely reasonable to conclude that in leukemia the new radioactive substances have nothing new to offer. Any type of radiation palliates chronic leukemia. No type seems to benefit in the acute cases.⁵

This does not mean that we cannot look forward to much of great scientific interest and possible therapeutic help from radioactive elements. Such isotopes, previously produced by the cyclotron in amounts detectable only by ultramicrochemistry, can now be expected from the atomic pile in sufficient quantity to render them available for medical experimentation. Radioactive phosphorus is concentrated in organs with a high phosphorus content such as bone, but experiments in the control of osteogenic sarcoma have been disappointing, because it has not been possible to reach a sufficiently high concentration in the tumor area. Radioactive iodine is concentrated in the thyroid, and early experiments show it may be very useful in the control of hyperthyroidism, or even sometimes in the control of thyroid carcinoma.

P-32 has a half life of 14.3 days—a fact which may make it much more useful than radon, which is customarily used for implantation in gold seeds, and which has a half life of a little less than 4 days. Low-Beer⁸ has recently used blotting paper moistened by P-32 to cure surface malignancies.

There are numerous interesting possibilities for

the use of radioactive isotopes, many yet unexplored. We can predict with reason and from more than ten years' experience, however, that there will be no advantage in the use of these substances over the commonly used types of radiation in the treatment of leukemia.

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FREEDOM FROM DOUBT

When the California State Supreme Court late last month issued its decision in the California Physicians' Service case it removed whatever doubt had previously existed as to the exact corporate structure and status of C.P.S. Litigation lasting more than six years was concluded and the doctors behind the program were given a green light to proceed under their original plans.

Behind this case was the desire of C.P.S. to prove itself a service organization, incorporated not for profit but for the good that could be delivered to the people of California. The original suit was filed in Superior Court by C.P.S., asking that the court declare C.P.S. not an insurance operation. The Superior Court agreed with the reasoning behind this suit and enjoined the state Insurance Commissioner from assuming jurisdiction over C.P.S.

On appeal from this decision by the Insurance Commissioner, the Appeal Court upheld the Superior Court; on appeal from that decision, the matter went before the Supreme Court.

On another page of this issue will be found a digest of the Supreme Court decision; it makes extremely interesting reading. For the benefit of those who do not wish to go over the entire digest, it is noteworthy that the Court looked upon C.P.S. from the human side and not merely from the business angle. The decision says:

"Probably there is no more impelling need than that of adequate medical care on a voluntary, low-cost basis. The medical profession, unitedly, is endeavoring to meet that need. Unquestionably this is a service of a high order and not indemnity."

In another place the Court characterizes C.P.S. as "a pioneer attempt by the physicians of California to make available medical care for those who find the cost of sickness a burden not easy to bear."

One result of this opinion is that there need now be no question about imposing on the people of California a gross premiums tax which would be levied against them if C.P.S. were held to be an insurance operation. Thus a tax on human suffering need not be levied. Another result is that the many corporations and business organizations which have been hesitant to enroll their employees in C.P.S. because of a possible cloud on the status of the service may now go ahead and bring the benefits of a high grade non-profit medical care service to their workers.

As for the doctors—and more than 7,400 of them are now physician members of C.P.S.—the most significant interpretation of this decision is the removal of doubt which has shadowed C.P.S. for six years. Wherever hesitancy may have existed before, it may now be dropped;

wherever questions arose as to just what corporate form C.P.S. may have occupied, there is now an answer.

The Supreme Court has given its opinion, a green light. The enrollment drives now being staged may continue without interruption. The

more than 265,000 present beneficiary members may be assured that their medical care is forthcoming and that the new members swelling C.P.S. membership rolls each day will receive the same high quality medical service on a non-profit co-operative basis.

Study of Child Health Services

The American Academy of Pediatrics has undertaken and now has begun a nationwide Study of Child Health Services. As the study gets under way in California, its sponsors are asking and surely should be given the full cooperation of physicians who are being called upon for needed factual information. It has the approval of the California Medical Association as well as of other organizations of physicians.

Purpose of the study is two-fold: (1) to collect data to be used as the basis for scientific planning so that physicians themselves, under the present system of the practice of medicine, will be better able to devise ways for equal and proper distribution of medical care to meet the health needs of all children in the post-war period; (2) to provide an armament of facts for intelligent argument against intervention by lay or government groups.

The study is by and for doctors of medicine. Practicing pediatricians are collecting the data. At the same time, the Academy expects govern-

ment agencies to accept the findings, since the United States Public Health Service will do all the manual statistical organization of the data submitted from the various states. (The Academy asked for and was granted advisory and statistical help from the Public Health Service and the Children's Bureau. These organizations enter the study only in those capacities.)

Encompassed by the study are an investigation of hospital facilities, public and semi-public health and community services; distribution, qualifications and activities of professional personnel; and the extent of pediatric education in the medical schools.

As their part, physicians in private practice are asked to fill out a one-page questionnaire, regardless of whether they see children in their practice or not. All information is strictly confidential.

Considering the scope and purpose of the study, this modest request appears to be one that should be complied with by even the busiest of physicians.

The Responsibility of the Physician in Premarital Examinations

The premarital examination law was enacted in 1941, and has been favorably accepted by the public and the medical profession. During the war years, however, some abuses and some circumventions of the law appeared which have recently been made the subject of a study by the California State Board of Health.

The language of the law is, as laws go, remarkably simple. The law specifies merely that a physician shall give his opinion that "the person is not infected with syphilis, or if so infected, is not in a stage of that disease which is or may become communicable to the marital partner," and that a blood specimen, designated as a "premarital test" shall be submitted to a laboratory. How thorough an examination should be made is left by the law as an open question. The physician is asked only to sign a statement that the person is not infected with communicable syphilis.

The actual mechanism of taking care of candidates for marriage was purposefully made simple. The Premarital Act, as written, anticipated that the patient would go to his physician and thence to the laboratory with a request for a premarital test. The laboratory then returns its report to the physician on a special blank which the State De-

partment of Public Health has supplied the laboratory. If the test is negative the physician merely countersigns this report and gives it to the candidates for marriage, who in turn present it to the Marriage License Bureau.

It is, in fact, the very simplicity and minimizing of red tape which have allowed irregular practitioners and laymen operating laboratories to circumvent the original intention of the law. In the Los Angeles area, for instance, until the State Board of Health compelled their removal, several laboratories near the Hall of Records had large electric signs advertising "Marriage Examinations—Four-Hour Service," or equivalent.

It is self-evident that such advertising was not calculated to encourage the couples to seek out the physician of their choice as the law intended, but instead, as is the case with so many schemes to commercialize medicine, left the physician in the position of a sort of undesirable end-product who was useful only for his signature.

Recent questionnaire studies by the California State Board of Health on large numbers of couples who have had premarital examinations, reveal that in some areas as many as 40 to 50 per cent of these couples go directly to such lab-

oratories which advertise or which are under lay control.

These studies show public dissatisfaction with such abuses. On the contrary, the public is found to be well pleased with premarital examinations when they are administered well by qualified doctors. Almost invariably the answer to "Do you approve of premarital examinations," was "Yes." Under "Comments" many couples said these examinations were a good idea, but as administered were merely a "racket" or a "joke." Since the couples making such answers were the ones who had gone directly to advertising or lay laboratories, and had not seen a doctor at all, the answers were about what might have been expected.

All the patients who were given adequate examinations seemed well satisfied and did not complain of overcharges. Those patients who merely had their backs inspected for a rash sometimes complained that they had been "short-weighted." On the contrary, there were never any complaints that examinations were more thorough than needed. To quote the old professor's maxim, "A patient cannot himself ask the

doctor to remember to do a rectal examination."

It is unfortunate that the law requiring a three-day waiting period has now been abolished, for many couples tend to demand "Four-Hour Service" because they see it advertised. A bulletin of information is now being given to couples seeking a premarital examination by the California State Board of Health, which suggests that a three-day interval be allowed in order to permit an adequate time for the physician's examination and laboratory examination.

Entirely aside from financial gain or loss to the physician, the humanitarian aspect of the problem should appeal greatly as an opportunity for service. Marriage, even though the divorce rate in some communities now runs higher than 90 per cent, is still a not-to-be-forgotten time in an individual's life. Not only is this contact with people an opportunity for the physician to establish friendly relationships for the future, but the chance thus afforded to give of our counsel to these young couples may mean the difference between a happy married life and one ruined by ignorance or lack of understanding.

THE VETERANS' CHOICE

Gratifying support for the medical profession came again last month from the American Legion, California Department. At its annual convention, with some 5,000 delegates present, the Legion adopted a resolution protesting compulsory health insurance and pointing toward the numerous voluntary medical care plans already available to the people of California.

Only last year the Legion went on record in this vein and participated in the fight against socialized medicine in the California Legislature. Now comes a reiteration of this stand, adopted not only by the guiding councils of the state Legion but by the entire slate of delegates. This comes from the rank and file itself and leaves no

doubt as to the position of the California Department of the Legion.

In the resolution opposing compulsory health insurance the Legion pointed out that such proposals "would increase the tax burden and would bring about regimentation of the medical profession." Left out of account was the fact that socialized medicine would lower the standards of medical care now received by Californians. We can only assume that the Legion regarded this topic as a scientific matter on which the doctors themselves are the best qualified observers. On the matter of regimentation, however, the doctors can think of no group better qualified to testify than the veterans of this country's two great wars.



Clinical-Pathological Conference

PRESENTATION OF CASE*

White male, age 37. Occupation, Editor.

History Summary: The history of this patient's illness dates back to 1919, at which time the patient developed a severe and protracted diarrhea, characterized by 4 to 10 watery bowel movements daily, accompanied by blood and mucus. Initially the patient was not treated in this hospital. Treatment consisted of bismuth and opium with a working diagnosis of colitis on an allergic basis, as the patient had both hay fever and asthma clinically.

In 1929 a cecostomy was done because of continued rectal bleeding and a weight loss of severe grade, his weight at that time being 72 pounds. Following this the patient began to gain weight and the bloody diarrhea ceased, until two years later when the cecostomy began to close spontaneously and the bloody mucoid stools reappeared. The cecostomy was revised at this time with improvement of the patient.

From 1929 to 1937 the patient had been active and fairly comfortable. However, at the end of this time, pain was noticed at the cecostomy opening which increased gradually over the past four years until the present admission. He now complains of almost constant pain in this region with extreme soreness and hyperesthesia of the surrounding skin.

In May, 1941, the patient was admitted to the Los Angeles General Hospital, remaining for a two-month period. At this time the following findings were noted: Hb. 85 per cent, WBC 12,200, Polys 82 per cent, prothrombin normal. Barium enema per rectum revealed marked narrowing as far as the mid transverse colon beyond which the patient could not retain the enema. The mucosal pattern in the region outlined was almost completely obliterated. A barium enema given through the cecostomy opening demonstrated a narrow transverse and descending colon without normal markings, pipestem in character. There was considerable reflux into the terminal ileum. The patient was then dismissed with instructions to return in three weeks for further surgery. During this period the patient took exercises and sun baths with a weight gain to 116 pounds.

Past History: The usual childhood diseases. Severe cerebral concussion in 1939, without skull fracture. Tonsillectomy in childhood.

Family History: Not remarkable except that mother was subject to hay fever.

Last Admission: At the time of his last admission on August 7, 1941, the patient reported that small amounts of fecal material and mucus were discharged from the anus at monthly intervals. Physical examination on entry revealed a fairly well nourished white male in no acute distress.

Temperature 99.2, pulse 86, respiration 20, blood pressure 128/80. Head and neck not remarkable except for carious teeth. Chest, lungs and heart not remarkable. Abdomen showed a functional fecal fistula (cecostomy) but no tenderness, masses, rigidity, or hernia. Peristalsis was frequent and normal. The remainder of the physical examination was not remarkable.

Laboratory Findings (August 15, 1941): Hb. 88 per cent of 17 gms. RBC 5,090,000. WBC 9,800. Polys 72 per cent. Urine, essentially negative. Pothrombin 65 per cent. Wasserman on blood negative.

Course: The patient was prepared for ileostomy preliminary to colectomy. This included the placement of a Miller-Abbott tube which was seen by x-ray to have descended almost to the cecum.

August 16, 1941: A single barrel ileostomy was performed during which the terminal ileum was divided, the distal portion closed, and the proximal limb brought out. The postoperative course was uneventful. The ileostomy was permitted to drain on August 21st.

In December a notation is made that the patient had made little progress physically or mentally. He preferred lying in bed rather than getting up. He had several "mental breakdowns" and it was felt that rehabilitation was necessary, but after attempts at this were made, the rehabilitation service was forced to give up further efforts. During this time the following laboratory data was secured: October 18, 1941: Blood chlorides 512, calcium 10, phosphorus 4.2.

January 18, 1942: The patient began vomiting and the cecostomy became fiery red and swollen. There was no fecal drainage and the abdomen was markedly rigid. The ileostomy admitted the tip of the small finger. The temperature was 100 and pulse 130. Total proteins 7 gms. WBC 9,500, Polys 74 per cent, Hb. 68 per cent, RBC 3,900,000. An intestinal obstruction was feared and a Miller-Abbott tube was passed after an x-ray revealed several distended coils of intestine in the left abdomen. A film of the chest at this time revealed soft diffuse foci of infiltration scattered through both lungs, most profusely in the left, consistent with pneumonia. After passing the tube, x-ray showed the distended coils and the tube to be displaced to the left as if by an abdominal mass, although no mass was identifiable in the film.

January 25, 1942: X-ray showed the tip of the Miller-Abbott tube had passed to the lower abdomen and the previously distended loops of bowel appeared decompressed. At this time nodular densities were noted in both os innominate and the sacrum consistent with prostatic metastases. The left side of the body of the first lumbar vertebra showed marked destruction consistent with an osteolytic metastatic focus. At this time the patient showed a NPN 25, blood chlorides 656, and blood proteins 5.5 gms. total.

* Taken from the Clinical-Pathological Conference, Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

February 8, 1942: The patient now complained of severe occipital headache and pain in the spine. On rectal examination a mass was felt in the region of the prostate that was "not very firm and does not feel like normal prostate." The right Babinski was equivocal, the Gordon and Oppenheim were positive, and there was a spastic contracture of the right thigh with severe pain when moved. The left leg was normal. The tongue deviated to the left and difficult speech developed. The WBC was now 11,600, polys 72 per cent and Hb. 68 per cent. Despite the fact that the Miller-Abbott tube continued to function well (at one time actually emerging from the ileostomy), the abdominal distention persisted. Spinal puncture revealed a clear fluid with pressure of 175 mm. no cells, negative Wassermann and normal proteins. Barium instilled through the tube did not progress in 8 hours.

February 17th: The abdomen was said to be more distended but obstruction was not present as the ileostomy was functioning adequately. His condition seemed to be deteriorating rapidly and the patient expired February 18, 1942.—G.D.C.

DISCUSSION BY CLINICIAN

DR. J. HOMER WOOLSEY*: The diagnostic problem that confronts us in this patient's history can be divided into two parts. In the onset he had obviously an ulcerative colitis of so-called undetermined origin. For it, we must comment, he had inadequate treatment, for any enterostomy in this disease should divert the fecal stream completely. The cecostomy that was done allowed the fecal stream to pass in part over into the diseased bowel and thereby keep the disease active. Eventually this cecostomy was revised.

The positive information given in this case history tells us that by barium enema there were marked pathological changes as high as the transverse colon. We should like the finding by rectal and proctoscopic study and also the bacteriological study of the rectal discharge. Not all but the majority of instances of true idiopathic ulcerative colitis arise in the rectum and gradually extend proximally.

We now come to the second part for diagnosis, since other symptoms not directly attributable to ulcerative colitis now arise. On August 16, 1941, an ileostomy was done. This means the abdominal cavity was exposed and information of value could have been obtained. In abdominal surgery a thorough examination of the viscera and recording of same should as a rule be done. Yet there are instances, and this is one, where such exploration could not be done, for even in the quiescent stage even slight handling traumatizes the bowel and may light up the disease or even rupture some of the friable bowel wall. Apparently no peritoneal tubercles or tumor metastases were observed.

The general course of the patient's illness is

now downward—loss of weight, strength, appetite and even interest to make any effort. By January, 1942, five months later, there was evidence of peritoneal irritation denoted by rigidity and vomiting, suggesting intestinal obstruction.

X-ray studies demonstrated a widely scattered pathology—changes in the pelvic bones indicative of metastatic carcinoma, a destruction of one side of the body of the first lumbar vertebra in contrast to involvement of the joint surface as would occur in tuberculosis and more likely in pyogenic osteomyelitis; changes in the lungs commensurate with congestion that could be metastases; and a displacement of the bowel into the left abdomen as if from a tumor mass and its associated adhesions with other viscera.

Later, nine days before death occurred, symptoms indicative of cranial involvement—headaches, changes in deeper reflexes of the right lower extremity; deviation of the tongue to the left and difficulty in speech, and a clear spinal fluid without cellular increase or protein change—were found.

Now, as I sum up the facts there existed an idiopathic, ulcerative colitis for 20 odd years. Mindful of the old precept that one disease with or without complications usually explains an illness, our thoughts are directed primarily to ulcerative colitis and its associated complications or sequelae.

Tuberculosis, however, must be strongly considered. We should have expected at the time the ileostomy was done some peritoneal tubercles or ileal involvement would have been noted; there would have been more involvement of the ileocecal region and less of the transverse and descending colon. The destructive process of the first lumbar vertebra is atypical of a tubercular lesion as previously mentioned. The pulmonary findings could represent a hematogenous extension, but again if tuberculosis was to be the main cause greater apical and hilar pulmonary involvement would be expected. The cranial metastases could occur but cellular change in the spinal fluid should have been present. Finally the rectal examination nine days before death occurred showed a mass on the rectal shelf above the prostate, that is in front of the colon, which would be associated with a peritoneal involvement, whereas if we were to have a tuberculous involvement we would have expected an extension down along the psoas muscle fascial plane from the involved vertebra and therefore would be behind the colon.

Abscess is common and hematogenous metastases of septic emboli giving osteomyelitis and lung abscess can occur. However, the metastases here are described as having characteristics otherwise than from an acute pyogenic type, and chills, fever, etc., of sepsis should have been prominent.

Malignancy in ulcerative colitis occurs in 2 per cent to 3 per cent of cases, is of the adeno type and arises from mucous membrane polyps that have occurred subsequent to the ulcerative colitis processes. There could have been a local involvement with local spread to have given a local

* Woodland Clinic, Woodland.

tumor mass, displacing the bowel to the left, and also a metastatic mass palpated on the rectal shelf. A hematogenous spread with involvement of the lungs and the vertebra and the ilium is described by the x-ray studies. There was also some involvement of the nervous system in the brain stem region, having effect on the spinal motor tracts and the twelfth cranial nerve, for we are told of the disturbance in the deeper reflexes of the right lower extremity, of the deviation of the tongue to the left, and the difficulty in speech—apparently motor in origin.

It is my opinion, therefore, that this man had primarily an idiopathic ulcerative colitis and a sequela of carcinoma with local and distant metastases and death as a result of the carcinoma.

DISCUSSION BY PATHOLOGIST

DR. GILBERT CURTIS: We have had some very erudite discussions here this afternoon, and so far the pathologists have come off second best, if we were considering this to be a contest. Knowing the pathologists who were preparing the other cases, I thought I would go from the sublime to the completely ridiculous and make it so obvious that it might be missed. Dr. Woolsey has crossed me up completely in my attempt to get him out on some rare and unusual limb. The patient did have ulcerative colitis. He did have a malignancy. There was a rectal shelf; there was tumor in the vertebral bodies from top to bottom. We have to give Dr. Woolsey the palm.

Dr. Woolsey was worried whether the proximal portion of the large bowel had been investigated, but evidently he overlooked the fourth paragraph in the protocol, because this patient was given an enema through a very unusual stoma.

[Slide.] The film that you see on this lamp shows the enema per rectum. I thought it would be of interest to show you how small and contracted the lumen of the bowel may become. This is the rectum following up and across to the mid-transverse colon. That doesn't look like very much of a colon. Now, because they couldn't see the portion of bowel proximal to this region they did a further study.

[Slide.] This was an enema given through the cecostomy, and the large mass of barium that you see in the center of this picture is in the small bowel. If you look closely, you can also see, starting at about this point, the transverse and descending colon and down into the sigmoid have been outlined, showing you again that narrow little ribbon band spoken of as a pipestem colon. Without an illustration you would never recognize that as a colon.

[Slide.] It was noted later that difficulty had arisen in this patient's vertebrae. I would like to

put this film on to show you that they didn't miss this disease.

[Slide.] I put this film on to show you that when we first got him the vertebrae were normal. Because of the major difficulty that many of you no doubt have experienced in the passing of these Miller-Abbott tubes, I thought you would like to see one after it got out of your hand. Here we see many distended loops of small bowel with the tube in place. Numerous films were taken because it is felt that taking isolated spot films requires less work than doing radiography with a screen.

[Slide.] The findings in the chest film were very suggestive. I will put it on here for what it is worth. You can draw your own opinion as to whether you think that is compatible with metastasis or was just an ordinary bronchial pneumonia.

At the time of the autopsy no lung metastasis was found.

[Slide.] Now this film was somewhat of a surprise. Several months had elapsed since this patient was first seen in the hospital, and I must admit that, on the first film that was seen during his last entry, any change in the pelvic bones was missed.

[Slide.] This is a re-check with a much more efficient technique used, and you can see the typical moth-eaten appearance of the bone. It was both osteolytic and osteoplastic, portions of the bone being almost completely destroyed.

Subsequent films show almost the same findings.

[Slide.] This Kodachrome slide shows a specimen, an autopsy specimen, in this particular case, involving the entire colon. I thought you would like to see this because, although it is not at all unusual, there are many here who have not been through the autopsy department recently, and these lesions are so striking. I thought it would be well to show the surgeons just exactly what they are up against when they have this type of patient.

You notice that this bowel shows many areas of polyp formation. These polyps are particularly numerous in the descending portion of the colon.

This man's initial malignant lesion was very insignificant. It had penetrated the wall of the bowel, rather than forming any bulky mass in the lumen of the bowel, with very extensive peritoneal metastasis.

I would like to show you a blown up portion of this area, which gives you a bit of an idea of how this bowel appears in the gross.

[Slide.] We have thickening and deep and shallow ulceration. The ulcers may be right through to the peritoneum and as a result, the patient may expire following colectomy because the surgeon may put his finger through one of these ulcers. This specimen happens to be from that type of complication.



CLINICAL CONFERENCE

FROM THE LOS ANGELES COUNTY GENERAL HOSPITAL SERVICE OF THE UNIVERSITY OF SOUTHERN CALIFORNIA SCHOOL OF MEDICINE

DOCTOR CLARENCE J. BERNE:* The patient to be considered today has a common disease with a few unusual features. Important problems in this type of case are being dealt with daily by many general surgeons. Doctor Blatherwick will present the case history.

Presentation of the Case by the Resident, Doctor Norman Blatherwick:

This 21-year-old white housewife entered the hospital because of attacks of pain in the right upper quadrant of the abdomen.

Three months ago she was delivered of a full term child. The pregnancy and delivery were normal. Soon afterward, the attacks of sudden severe pain began, frequently after a fatty meal. The pain was located along the right costal margin and radiated to the angle of the scapula on the same side. Nausea and vomiting accompanied the attacks. There was intolerance to fatty foods. The family physician had seen her in several attacks, and he had given morphine with relief of pain. She stated that possibly on one occasion the stools were light and the urine dark after an attack. Jaundice was denied. However, at the time of her first visit to the out-patient clinic one week before admission, there was mild but definite jaundice. The past medical and family histories were otherwise uninformative. She had taken no hepatotoxic medication.

Physical examination revealed a well nourished young woman of the sthenic type. No icterus could be made out. The physical findings were all quite normal. Particularly, the liver, spleen and right kidney could not be felt and there was no tenderness in the upper abdomen. The temperature, pulse and respirations were normal. The blood pressure was 108 mm. of mercury systolic, 70 mm. of mercury diastolic. The hemoglobin was 90 per cent and the leucocyte count 9,250 per cu. mm. with 75 per cent neutrophils. No abnormalities were found in the urine. Serologic tests for syphilis were negative. The icteric index was 7 units two days following admission and 11 units a few days later. The blood prothrombin determination was normal. The blood cholesterol was 235 mg. per 100 cc. The serum albumin was recorded as 4.2 gm. and the serum globulin as 1.2 gm. per 100 cc.

DOCTOR BERNE: We will ask Doctor Pattison to discuss the diagnosis on the basis of the record up to this point.

DOCTOR ARTHUR C. PATTISON:* The history of this patient's disease breaks down readily into two phases: the first is of pain characteristic of biliary colic associated with qualitative dyspepsia between attacks, the second is the appearance of jaundice. Although attacks of biliary colic may occur without calculi being present, the appearance of jaundice makes it necessary to conclude that common duct involvement has occurred, and the most likely explanation is that one or more calculi have entered the common duct. When the clinical picture is correlated with the recent pregnancy, one of the most important known etiologic factors in cholelithiasis is added. The manner in which pregnancy influences the development of gall stones is not known, but it is probably involved with cholesterol metabolism more than it is related to stasis. Because this patient's description of her pain is so typical of biliary colic, and because of the secondary appearance of transient jaundice, I believe that a diagnosis of cholelithiasis is justified.

Cholelithiasis in the young may be conditioned by another factor, the excessive excretion of bilirubin seen in the presence of familial hemolytic icterus. There is no familial history of jaundice in this patient, no attacks of jaundice preceded the attacks of pain, and there is no anemia. Further blood studies, including erythrocyte fragility tests, would be necessary to exclude such a possibility completely. Other lesions capable of producing the syndrome presented by this patient may now be considered. It could result from a duodenal ulcer located low in the second portion of the duodenum, and involving the papilla of Vater. Inflammation in a peri-Vaterian duodenal diverticulum could produce such a picture. Both lesions are quite rare, however, and an upper gastro-intestinal x-ray study would be necessary to establish such diagnoses. We have seen instances of pseudobiliary colic in cirrhosis of the liver which have closely simulated biliary colic. Although the jaundice would be consistent with cirrhosis, the history, physical findings and laboratory studies in this case all fail to suggest the presence of cirrhosis.

Renal colic may closely resemble biliary colic, but the bedside differentiation at the time of an attack usually is not difficult; of course, at this time the presence of jaundice is a deciding factor in favor of the biliary tract lesion. Jaundice may

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occur secondary to pyelonephritis, presumably as the result of a secondary hepatitis, but is quite rare. A much greater problem in young people is the differentiation between obstruction of the common duct and primary hepatitis, particularly the infectious hepatitis due to virus infection (formerly called catarrhal jaundice). The sporadic atypical case of infectious hepatitis may, like syphilis of the liver, simulate many lesions of the biliary tract and must be diagnosed laboriously by exclusion, and waiting. Fortunately vitamin K has made the waiting much safer. In this case the intensity of the pain, and its occurrence dissociated from the jaundice would reasonably exclude infectious hepatitis, and the same may be said for toxic hepatic injury. One might ask whether or not there is enough evidence of liver disease to make us call upon the laboratory for more help. It seems that there is not. It becomes apparent that our differential diagnosis has presented no other condition that seems likely.

Consideration should next be given to the x-ray studies. They will be reported by Doctor Blatherwick and discussed by Doctor Berne.

DOCTOR BLATHERWICK: The gall bladder is well visualized, its size and position are normal for the patient's habitus; there are no filling defects, and there is good emptying after the fat meal.

DOCTOR BERNE: In cases with clinical pictures similar to this a presumptive diagnosis of gall bladder disease with calculi would be arrived at by most clinicians. The difficulty is the presence of a normal cholecystogram. With this diagnostic procedure false-positive tests are the most common error, and the cause usually can be identified by a check on the factors of assimilation, liver function and radiologic technique. Priodax has been a significant contribution to the reduction in the size of this false-positive group. A false-negative test, however, must usually be checked entirely on clinical grounds. Two important conditions in which false-negative tests occur are cholesterosis of the gall bladder and the cholelithiasis of the parturient primipara. In the latter instance it is usual for the calculi to be millet sized, not numerous, and be contained in a gall bladder otherwise normal. The same situation can occur, of course, at other ages and in the opposite sex, but it is particularly likely in women of this patient's status. The usual radiologic technique may show a normal gall bladder and no calculi. But if the film be made with the patient standing, enough calculi may gravitate and pile up in the fundus to enable their detection. Awareness of this fact may, if coupled with a strong clinical conviction, furnish the clinician a basis for securing such films. Further, if the upright films are negative, one must be prepared, under such circumstances, to advise operation. In this case we have such a situation and surgical treatment is therefore advised.

There exists a second consideration of importance; the "yellow flag" has been raised. It, therefore, becomes mandatory to assume that a common

duct lesion, almost certainly a calculus, does exist or has existed. When jaundice occurs as the result of gall stones, it must be assumed that the common duct is involved. This patient's common duct must be explored at the time of surgery. Negative palpation will not alter this responsibility. Surgery for gall stones is biliary tract surgery, not gall bladder surgery. Many of the most experienced surgeons now open the common duct on nearly half their cases of cholecystectomy and find stones in half the ducts so explored. Every surgeon who operates for gall bladder disease must be keenly aware of the indications for choledochotomy. It has been said that the bug-bear of gastroenterostomy is jejunal ulcer; it might also be said that the bug-bear of cholecystectomy is the overlooked common duct stone. Such a stone may not produce jaundice until the patient has recovered from a cholecystectomy.

Such principles must be applied in the case we have today. It might be argued that further observation or studies are indicated. Waiting will invite complications. This patient's situation is so typical that in our opinion it is wisest to make the diagnosis of cholelithiasis on clinical grounds and advise surgery.

Relative to the surgical treatment of cholelithiasis much can be heard regarding poor results. One of the potent causes of poor results is procrastination. Between attacks the patient may be well. Both the patient and the doctor may gamble on avoiding recurrence. We must realize that once stone migration is attempted, the process is basically progressive. With progression, complications develop. These may involve the liver, the ducts, and the pancreas as well as the gall bladder. The more extensive the involvement becomes, the less reversible is the process. Ideal results are most possible if surgery can be done before complications have developed, and therefore surgery is clearly indicated when attempted migration has been diagnosed.

Another important factor in determining poor results is the failure to do a complete and meticulous exploration of the entire abdomen including the esophageal hiatus area as soon as the abdomen is opened. The resultant failure to detect co-existing undiagnosed lesions often results in their effects being attributed to failure of the biliary tract surgery. A third group of poor results are dependent upon technical accidents at the time of cholecystectomy, conditioned by the presence of severe pathologic change or the presence of anomalies. In regard to the anomalies, it is a rare surgeon who can remember them all. Every case should be approached as though it presented an unknown anatomical arrangement and nothing should be clamped or cut or tied until it has been positively identified.

One other phase of treatment may be mentioned as it applied to this case. Exploration of the choledochus will require that drainage of it be established with a T-tube. Before removal of the tube, cholangiography will be done by the injection of lipiodol down the tube under fluoro-

scopic observation. Nitroglycerin will be given sublingually just before the injection. Free flow into the duodenum, with no filling defects in the duct, will give assurance that removal of the tube can be safely carried out. If a calculus is found, having been undetected at the time of surgery, we will resort to Best's regime. If that fails, Pribram's method of ether injection may be cautiously tried. If the calculus is still not dislodged reoperation will be postponed for some time and the Best regime will be repeated frequently.

FOLLOW UP NOTE

At the time of operation the gall bladder was found to be grossly normal. It contained about 20 calculi the size of wheat grains. One 5 mm. stone was present in the common duct. Microscopic study of the gall bladder wall revealed subserosal thickening and round cell infiltration of the mucosa. The convalescence was satisfactory. Cholangiogram was negative. Six weeks after discharge the patient was seen in out-clinic and was free of her previous symptoms.

ARMY PHYSICIAN FINDS PENICILLIN EFFECTIVE FOR SORE THROAT

After studying 28 soldier-patients in the Hawaiian Islands, Capt. Selvan Davison, Medical Corps, Army of the United States, concludes that penicillin has a definite place in the treatment of acute sore throat.

Writing in the July 27 issue of *The Journal of the American Medical Association*, Captain Davison says that while penicillin gave good results in all of the acute sore throat cases which he treated, it was found especially effective in patients whose illness was due to the germ called hemolytic streptococcus. This germ is implicated in a large number of acute sore throat cases.

Captain Davison states that he undertook his study because doctors forever are seeking an ideal therapeutic measure which will obtain rapid and complete cure for sore throat.

The army physician quotes one investigator who previously had treated 28 cases of acute sore throat with penicillin, using 15,000 units every four hours, day and night. In this study, it was found that cases treated for less than six days with 15,000 unit dosages of penicillin showed comparatively poor results because of frequent relapses; yet patients treated for six full days showed excellent results.

Captain Davison says that on the basis of the previous investigation, he studied the possibility of giving a shorter but more intensive course of penicillin treatment.

All of Captain Davison's patients were young adults with no complicating diseases. No patients were treated who had been ill for more than 48 hours.

Penicillin was administered in the amount of 20,000 units every three hours, day and night, by intramuscular injection. The average total dosage of penicillin was 360,000 units over a period of 54 hours.

There was only one relapse, in which recovery occurred without further penicillin. One case did not respond until sulfadiazine replaced penicillin as the treatment.

Most of the patients showed complete recovery in two or three days. The patients from whom no bacteria were obtained displayed normal throats in an average of under four days.

"It must be remembered," Captain Davison writes, "that the periods of time noted are the upper limits. Disappearance of symptoms and of signs means complete absence. There had to be not the slightest pain on swallowing nor any remaining exudate or inflammation before a time element was established."



MEDICAL PROGRESS

THE Rh FACTOR IN CLINICAL OBSTETRICS

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OBSTETRICIANS have recognized with extraordinary rapidity the practical importance of the recently-gained knowledge concerning the Rh blood factor. Since its discovery by Landsteiner and Wiener⁵ in 1940, the clinical implications of its behavior have been accorded widespread consideration and use. Indeed, the mechanism of action of the Rh factor both in transfusion reactions and during gestation is now such common knowledge, thanks to numerous comprehensive review papers,^{2,3,11,14,15} that more than a brief recapitulation here of the basic facts would be redundant.

Approximately 85 per cent of individuals of the white race carry in or on their red blood cells an antigen known as the Rh factor—they are "Rh-positive." The remaining 15 per cent are Rh-negative in that they do not possess this antigen. When Rh-positive red blood cells are introduced into the tissues or blood stream of an Rh-negative individual, the serum of the latter may develop Rh antibodies which have the power of agglutinating and/or hemolyzing Rh-positive red blood cells. This antibody-producing ability varies considerably among Rh-negative individuals, sensitivity to the antigen being high in some and quite low in others. Such iso-immunization or sensitization, once established, may persist for long periods of time.

This mechanism explains many of the transfusion reactions which occur between apparently compatible bloods; the latter are compatible in the A, B, O group system but not for the Rh characteristic. Such transfusion reactions occur in individuals who have been immunized to Rh-positive red blood cells by previous transfusion, multiple transfusions, intramuscular injection of blood, or by iso-immunization attendant on gestation. The latter is of especial interest to the obstetrician.

The possession of the Rh factor by the red cells of an individual is a matter of inheritance. The characteristic is brought about by two allelic genes represented as Rh (positive) and rh (negative), the former being a dominant gene in the Mendelian sense. Thus an Rh-positive phenotype may be either homozygous (RhRh) or heterozygous (Rhrh), whereas an Rh-negative phenotype can only be homozygous (rhrh). It is apparent, then that any mating involving a homozygous Rh-positive husband or wife can only give rise to an Rh-positive phenotype offspring. Where both husband and wife are Rh-negative the child must also be Rh-negative.

The obstetrician is especially concerned with those matings in which the wife is Rh-negative and the husband Rh-positive, for if the latter be homozygous an Rh-positive child will always result, while if he be heterozygous there is a 50 per cent chance of producing an Rh-positive child. It is when this type of Rh mismatching occurs—an Rh-positive child borne by an Rh-negative mother—

that serious obstetrical problems are most likely to eventuate. The chance that such a mating will result in an Rh-positive child is about 70 per cent.

Under these circumstances the presence of the Rh-positive child in utero may lead to iso-immunization of the mother. The basic mechanism responsible for this effect is probably the introduction of fetal red blood cells into the maternal circulation, but the factors controlling its occurrence and extent remain to be clarified. A defect in the placental barrier must be postulated; and it may be that the not uncommon "deportation of villi" satisfies this requirement. The known variability of sensitivity to Rh antigen action undoubtedly plays some part in the maternal reaction to fetal red blood cells. In any event, many Rh-negative mothers who carry Rh-positive pregnancies show no evidence of Rh antibody formation, whereas others develop a rapidly rising titer.

Whatever the regulatory factors may be, whenever an Rh-positive fetus immunizes an Rh-negative mother the maternal antibodies are passed through the placenta to the fetus with varying detrimental results to it. There is thus produced an agglutination and hemolysis of the fetal Rh-positive red blood cells, resulting secondarily in progressive anemia, liver damage, splenomegaly, hypoproteinemia, jaundice, edema, extramedullary erythropoiesis, placental changes, and fetal hypoxemia; in short, all the signs of erythroblastosis fetalis. This is, indeed, the generally accepted pathogenesis of the major percentage of cases of this disease—perhaps better termed hemolytic disease of the newborn.

This mechanism may function with varying speed in different Rh-negative mothers; rapid production of maternal antibodies with severe damage to the fetus may occur in the first pregnancy of one mother; iso-immunization in another mother may not become well enough established to be appreciably harmful to the fetus until the second, third, or fourth pregnancy.

Transfusion of incompatible Rh blood, however, constitutes a more direct method of establishing Rh antibodies in an Rh-negative mother—without the occurrence, be it noted, of any transfusion reaction. Giving such a woman Rh-positive blood—at any time prior to or during the childbearing age—may establish such a potentially high level of Rh antibodies that the Rh-positive infant of a subsequent pregnancy, subject to the hemolyzing and agglutinating action, may manifest hemolytic disease of the newborn.

The foregoing summary of the role of the Rh factor in the etiology of hemolytic disease of the newborn (erythroblastosis fetalis) is, of course, an oversimplification, for many cases of the disease—to be discussed presently—cannot be accounted for on this basis. Perhaps a scrutiny of clinical cases will point out more clearly the areas of the Rh-factor problem where our knowledge is incomplete.

INCIDENCE OF HEMOLYTIC DISEASE OF THE NEWBORN

In its full-blown manifestation erythroblastosis fetalis presents an unmistakable clinical picture,

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From the Division of Gynecology and Obstetrics and the Sub-division of Preventive Medicine, University of California Medical School.

whether in the icterus gravis or hydrops fetalis variety; and even lesser degrees of hemolytic disease of the newborn leave little doubt as to the diagnosis. But a moderate number of newborn infants in whom a definite diagnosis of erythroblastosis cannot be made show, nevertheless, one or more of the physical signs and laboratory findings associated with the disease. The incidence of such offspring in matings involving mixed Rh types has been such as to lead us to feel that we may be dealing with subclinical manifestations of hemolytic disease of the newborn. (Indeed, the occurrence of such cases constitutes one reason for preferring the broader term "hemolytic disease of the newborn" to the narrower one "erythroblastosis fetalis.")

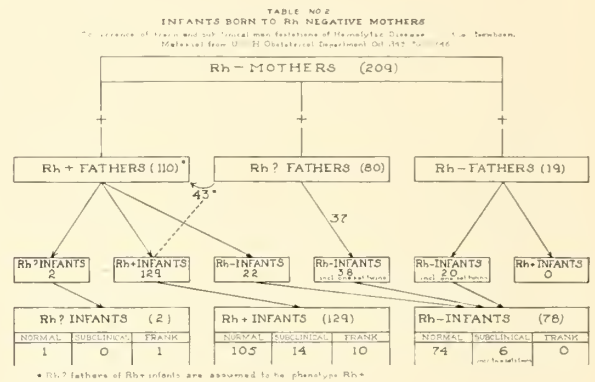
Thus, the occurrence of such conditions as enlarged liver, enlarged spleen, nucleated red blood cells in excess of 5 per 100 white blood cells, icterus, bleeding tendencies, anemias, golden yellow amniotic fluid, hydrocephalus, and edema may well be evidences of a mild trauma to the fetus resulting from Rh iso-immunization. From the series of cases to be presented here we have selected 20 which seem to warrant consideration from this point of view. The clinical bases for this selection are presented in Table No. 1. In considering the obstetrical aspects of the Rh factor it is well to bear in mind that these subclinical

TABLE 1.—Findings in Infants Judged to Show Subclinical Manifestations of Hemolytic Disease of the Newborn (20 cases)

Rh POSITIVE INFANTS:	
* Case No. 1:	Icterus, enlarged spleen, NRBCs—4%
No. 2:	Persistently enlarged spleen
No. 3:	Persistently enlarged liver and spleen
No. 4:	NRBCs—14%
No. 5:	Persistently enlarged liver and spleen
No. 6:	Yellow vernix, enlarged liver and spleen, NRBCs—12%
* No. 7:	Prematurity, icterus, anemia, enlarged liver, NRBCs—9%
No. 8:	Icterus, enlarged liver and spleen, NRBCs—10%
No. 9:	Persistently enlarged liver and spleen, Melena
* No. 10:	Edema, icterus, NRBCs—4%
No. 11:	Enlarged spleen, NRBCs—6%
No. 12:	Enlarged liver, icterus, petechiae, NRBCs—4.5%
No. 13:	Yellow amniotic fluid, enlarged liver
No. 14:	Prematurity, enlarged spleen, hydrocephalus, NRBCs—1%
Rh NEGATIVE INFANTS:	
No. 15:	Icterus, enlarged liver and spleen, NRBCs—5%
No. 16:	Icterus, enlarged liver, NRBCs—4%
No. 17:	Enlarged liver, NRBCs—5%
No. 18:	Enlarged liver, persistent edema
* No. 19:	Icterus, anemia, enlarged spleen, NRBCs—40%
No. 20:	Icterus, NRBCs—8%
* Cases in which a diagnosis of hemolytic disease of the newborn was entertained but not definitely made.	
("NRBCs—10%" signifies "nucleated" red blood cells—10 per hundred WBCs.)	

cases may well represent a group of infants with an impaired but not hopeless survival prognosis, a group which will be the most susceptible to salvage through clinical alertness and skillful therapy.

The very nature of Rh iso-immunization indicates that from a practical clinical viewpoint the pregnancies of Rh-negative mothers will require the principal attention. The illustrative material here presented consists of 209 such pregnancies resulting in the birth of 211 infants (two sets of twins) in the Division of Obstetrics and Gynecology of the University of California Hospital. Table No. 2 presents the data concerning them with regard to: Rh factors involved in each mat-



ing, Rh status of the infants, and presence or absence of hemolytic disease of the newborn.

Table No. 3 presents the incidence of hemolytic disease of the newborn for the 209 pregnancies. There were 11 frankly erythroblastotic babies, an incidence of 5 per cent. Of these 11 infants only two survived, a mortality of 82 per cent. Twenty infants of these pregnancies showed subclinical manifestations of hemolytic disease of the newborn, an incidence of 10 per cent. All of these 20

TABLE NO. 3
INCIDENCE OF HEMOLYTIC DISEASE OF THE NEWBORN IN INFANTS OF Rh NEGATIVE MOTHERS. (211 INFANTS)

TOTAL INCIDENCE	FRANK—	5.2% (11)	14.7%
	SUBCLINICAL—	9.5% (20)	
INCIDENCE IN Rh+INFANTS	FRANK—	5.2% (11)	11.8%
	SUBCLINICAL—	6.6% (14)	
INCIDENCE IN Rh-INFANTS	FRANK—	0% (0)	2.9%
	SUBCLINICAL—	2.9% (6)	

infants survived the neonatal period. Fifteen per cent, then, of infants of Rh-negative mothers suffered from the effects of iso-immunization, and for these 31 infants the mortality was 29 per cent.

RELATION OF HEMOLYTIC DISEASE OF THE NEWBORN TO PARITY

All investigators have emphasized that increasing parity subjects successive Rh-positive infants to increasing risk. But there has been, perhaps, an overemphasis on the degree of safety enjoyed by the child of a primigravida mother. While our series of cases is too small to permit full analysis with regard to parity of the mothers, an inspection of it from this viewpoint is illuminating. Of the 211 infants 92, or 44 per cent, were delivered of primigravidae. Of the 31 cases of

hemolytic disease of the newborn 12, or 39 per cent, were infants of primigravida pregnancies, and of this number 2 were cases of frank erythroblastosis fetalis. It is apparent, then, that when a mother is Rh-negative obstetrical vigilance cannot be relaxed appreciably simply because she is carrying her first pregnancy.

ANTEPARTUM PREDICTION OF HEMOLYTIC DISEASE OF THE NEWBORN

What observations shall this vigilance include? Fortunately, the availability of fairly simple and satisfactory titration methods,¹⁵ not only for Rh typing but also for Rh antibodies, provides an opportunity to be forewarned prior to delivery of an infant with hemolytic disease of the newborn. Rh typing of all pregnant mothers at once separates them into an Rh-positive group, in which the likelihood of fetal affliction is extremely small, and an Rh-negative group in which its incidence is high. When, in the latter group, the father is Rh-positive, continued attempts must be made to discern the presence of the disease in the intrauterine fetus.

This is best—though still unsatisfactorily—accomplished at present by means of repeated antepartum determinations of maternal Rh antibody titer. While the interpretation of titer levels is not yet clear, most workers agree that the appearance of any detectable Rh antibody in the maternal serum should warn the obstetrician that the intrauterine fetus is probably being subjected to hemolytic disease damage.

Fig. 1 presents a graphic representation of the correlation, for our series of cases, of the clinical status of infants of Rh-negative mothers and

here they have been consolidated to absent, trace, and present.

One hundred per cent of mothers of frankly erythroblastotic infants showed the presence of a trace or more of Rh antibodies. Sixty-six per cent of the mothers of infants with subclinical hemolytic disease of the newborn showed a trace or more—though 34 per cent of such mothers showed no titer at any time even though their infants apparently suffered from some degree of the disease. Sixty-four per cent of the mothers of clinically normal infants showed no Rh antibody. Note, however, that 36 per cent of such mothers did develop antibodies even though no evidence of iso-immunization damage could be clinically observed in their infants. The cause of such antibody development is at present unknown—or, from the opposite viewpoint, the reason why the babies are protected from damage is unknown.

From a clinical point of view we can only conclude that while the antepartum occurrence of maternal Rh antibodies leads to an increased expectancy of delivery of a damaged infant, it does not necessarily predict such an outcome. On the other hand, absence of maternal Rh antibodies does not necessarily mean that the infant will escape all manifestations of hemolytic disease of the newborn—though in the small series reported here frank erythroblastosis was invariably associated with the development of maternal Rh antibodies (only a trace in one case).

The recent discovery by Wiener^{15,16} of the so-called "blocking antibody" has complicated the situation. While the exact nature of this antibody is as yet undetermined, it is known to act in such a way as to spoil or "block" the usual agglutination test for Rh antibodies. Thus, the presence of blocking antibodies in maternal serum may serve to obscure the presence of Rh agglutinins if only the simple test for the latter is run. Fortunately, the blocking antibodies may be titrated separately;¹⁶ and it is likely that both tests will be required for all antepartum mothers where Rh immunization is suspected if we are to predict with any accuracy the occurrence of hemolytic disease of the newborn. The findings represented by Fig. 1, for example, are probably explained to some extent by the blocking antibody factor, which was not taken into account in this analysis.

Recently, however, Page, Hunt, and Lucia,⁹ testing antepartum maternal sera for both Rh agglutinins and blocking antibodies, have given further insight into the significance of these antepartum titrations. Their findings indicate that while the height of the titer may tell us something about the likelihood of hemolytic disease of the newborn, much more indicative is the *length of time* before delivery that these antibodies are present in maternal serum. The graphic chart of Fig. 2 was constructed, with the permission of the authors, from the data of Page, Hunt and Lucia's paper. (Their clinical criteria for subclinical manifestations of hemolytic disease of the newborn approximate our own.)

RELATION OF MATERNAL ANTI-Rh ANTIBODIES TO THE CLINICAL STATUS OF INFANTS OF Rh NEGATIVE MOTHERS.

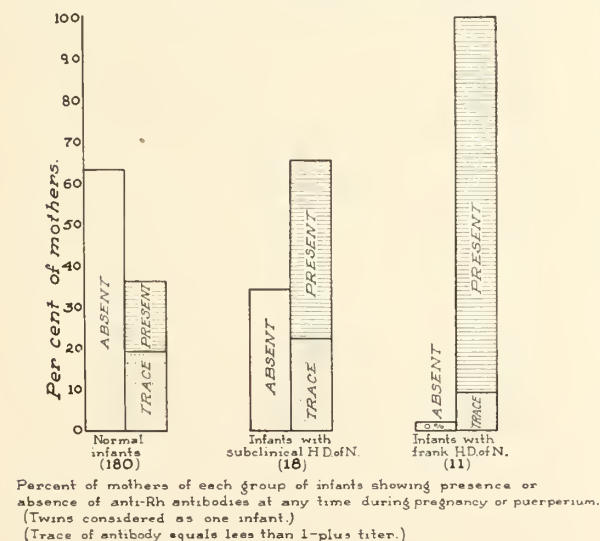


Fig. 1.

the presence or absence of maternal anti-Rh titer at any time during pregnancy or the puerperium. In the 209 pregnancies titers were recorded as absent, trace, 1-, 2-, 3-, and 4-plus; for analysis

RELATION OF INCIDENCE AND DEGREE OF FETAL MANIFESTATION OF HEMOLYTIC DISEASE OF THE NEWBORN TO ANTEPARTUM DURATION OF THE PRESENCE OF MATERNAL ANTI-Rh ANTIBODIES

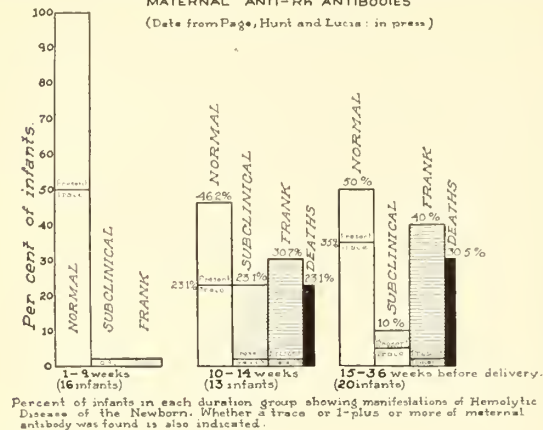


Fig. 2.

While their series of cases is small, it is highly suggestive of certain conclusions. When either antibody appeared in the maternal serum only 1 to 9 weeks before delivery, 100 per cent of the delivered infants were clinically normal. When it appeared 10 to 14 weeks before delivery, 54 per cent of the delivered infants showed some evidence of hemolytic disease of the newborn. When it appeared 15 to 36 weeks before delivery, 50 per cent of infants showed the disease.

More important than incidence of the disease is the fact that the severity of its manifestation paralleled even more closely the antepartum duration of maternal titer. Thus, in the 1- to 9-week group there was no frank erythroblastosis fetalis; in the 10- to 14-week group 31 per cent of the infants had frank erythroblastosis fetalis, and the mortality for the group was 23 per cent; in the 15- to 36-week group 40 per cent of the infants were frankly erythroblastotic, and the mortality for the group was 31 per cent.

The clinical implications of these findings are so clear-cut that reference will be made to them again in the discussion of prophylaxis and treatment of hemolytic disease of the newborn.

HEMOLYTIC DISEASE OF THE NEWBORN FROM CAUSES OTHER THAN Rh IMMUNIZATION

Table No. 3 shows an incidence of 3 per cent of hemolytic disease of the newborn occurring in Rh-negative infants, all of the 6 cases thus represented being subclinical manifestations. But that frank erythroblastosis fetalis may occur under similar circumstances is illustrated by the case of a private patient not included in our series. This patient was a 21-year-old primigravida whose blood study revealed a negative Kahn and Kolmer, Group O, Rh-negative. The delivered infant, Group A, Rh-negative, had frank erythroblastosis fetalis but survived the neonatal period. Postpartum study of the maternal serum showed no evidence of Rh antibodies but the anti-A titer fluctuated between 1/128 and 1/1024. Boorman, Dodd and Mollison¹ reported two cases of clinical

erythroblastosis fetalis in infants whose bloods were both Group B, Rh-positive while those of the mothers were Group O, Rh-positive. The maternal anti-B titers were 1/3200 and 1/8,000,000 respectively. LaVake⁶ reported a similar case. Polayes¹⁰ reported two cases of Group O, Rh-positive mothers who bore Group A, Rh-positive infants; both infants were frankly erythroblastotic. The maternal anti-A titers were 1/700 and 1/750 respectively.

It is clear then that iso-immunization by antigens other than the Rh antigen may, through a similar mechanism, produce hemolytic disease of the newborn. Indeed, it is likely that Rh subgroup reactions may account for a few cases, eight such sub-groups having been established.¹⁵ The part that M, N, and P sub-groups may play has not yet been delineated.

The existence of an Hr antigen has also been established,^{7,8,13} so called because it is present in the blood of Rh-negative individuals. While it appears to have been the etiological factor in a few cases of hemolytic disease of the newborn, its importance has not yet been clarified. At present, however, titrations of it are thought to be of some value in determining whether an Rh-positive individual is homozygous or heterozygous, a matter of considerable importance in predicting the status of future infants of Rh-positive father-Rh-negative mother matings.

On the whole, however, obstetricians will be well advised to bear in mind that hemolytic disease of the newborn may occur unexpectedly, though very rarely, in infants of matings where the bloods are supposedly compatible.

PROPHYLAXIS OF HEMOLYTIC DISEASE OF THE NEWBORN

Protection of prospective mothers from iso-immunization, insofar as this is possible, is, of course, of prime importance in preventing the occurrence of hemolytic disease of the newborn. Any woman before or during the childbearing age for whom blood transfusion is contemplated should have Rh typing as well as the routine cross-matching procedures in order to eliminate the possibility of introducing Rh-positive blood into an Rh-negative blood stream. Obstetricians and pediatricians cling to the habit of giving blood intramuscularly to newborn infants for various purposes. Whether an iso-immunization to the Rh factor thus produced in a female child would persist long enough to increase the fetal hazard in a subsequent pregnancy has not yet been established; but until enough years pass to clarify this point it might be advisable to avoid this time-honored but dubious procedure.

That all pregnant women should routinely have Rh typing is self-evident. The husbands of those who are Rh-negative should be similarly studied in order to prepare for and warn the prospective parents of the possible eventualities. While the present serological methods for determining whether an Rh-positive father is homozygous or

heterozygous are still in the experimental stage, we may reasonably expect them to be developed to a degree of dependability which will make the prediction of the chances for the occurrence of an Rh-positive child much more certain. For the present, careful scrutiny of the previous obstetrical history in multigravidae often constitutes the only mode of approach to this information.

Dissemination of information about the Rh factor and erythroblastosis through lay publication channels has resulted in the obstetrician being increasingly confronted by requests for advice from worried prospective parents—especially when the latter have discovered that they are Rh incompatible. Even nulliparous wives now express doubts about undertaking pregnancy at all in the face of such incompatibility.

Such patients may be reassured by the fact that the likelihood of a primigravida mother bearing a frankly erythroblastotic child is not great, and that even if one is borne its survival chances are reasonably good. Potter and Wilson,¹² reporting over 100 erythroblastotic infants, found 100 per cent survival in those borne by primigravidae—though the number of such infants is not given. (Indeed, this absence of mortality for an admittedly lethal disease leads one to wonder about their criteria for diagnosis.) On the other hand, the likelihood that an Rh-negative mother with an Rh-positive husband will bear a frankly erythroblastotic child is not as negligible as some authors have suggested. Even in our small series two such cases were encountered, neither one of which was the result of previous transfusion, and only one of which survived. The primigravida, however, runs such a small risk of bearing a still-born or seriously injured infant that when she allows fears about erythroblastosis to upset her, emphasis should be placed on the probability of a happy fetal outcome.

The outlook for the later pregnancies of the Rh-incompatible couple is less hopeful though not by any means grave. If, in previous pregnancies, no serological or fetal clinical evidence of maternal iso-immunization has been encountered, the risk to the child is not much greater than it was in previous pregnancies, and the patient may be reassured on this basis.

Once maternal iso-immunization has been established, however, the picture changes abruptly. In subsequent pregnancies the likelihood of an unfortunate fetal outcome greatly and progressively increases—especially if the father be a homozygous Rh-positive. Guidance of the iso-immunized mother constitutes a difficult problem. Our knowledge of the factors involved in the production of hemolytic disease of the newborn is still too incomplete to permit of any definitive decision regarding advice to mothers under such circumstances. Cases will require individualization based on serological study and previous obstetrical history. But with increasing frequency three questions present themselves: that of the justification

for sterilization, the justification for therapeutic abortion, and the propriety of artificial insemination with semen from an Rh-negative donor. The final answers become a matter for individual decision, to the ease of which further knowledge will undoubtedly contribute.

The study of antepartum anti-Rh and blocking antibody titers, however, offers one avenue of attack in the prophylaxis of hemolytic disease of the newborn. Dependence upon the level of titer alone would seem ill-advised at present. Uncertainty still exists regarding its significance. A rising titer may indicate increasing damage to the fetus or it may not. Possibly a rising titer followed by a fall may point to more rapid absorption of maternal Rh antibodies by the fetus with consequent increasing damage.⁴

The work of Page, Hunt, and Lucia, however, suggests very strongly that the antepartum duration of detectable maternal anti-Rh (or blocking antibody) titer may serve as a measure of the severity of hemolytic disease in the intrauterine fetus. Present opinion is divided on the value of premature interruption of pregnancy for the purpose of averting serious manifestations of the disease in the newborn. It is difficult to decide between the increasing hazards which go with increasing prematurity and those to which a fetus is subject while it remains in an environment where Rh antibodies have access to its blood.

On the other hand, if the findings of Page, Hunt and Lucia are confirmed by larger series it would appear that increasing time spent by a fetus in such a detrimental uterine environment—no matter what the type and concentration of maternal Rh antibodies—is more damaging than we had suspected. The dividing line between serious and subclinical damage would seem to fall at approximately 10 weeks antepartum. For an Rh-negative mother, then, who first evidences anti-Rh titer *less than 10 weeks* before term it would seem advisable to allow spontaneous onset of labor unless the pregnancy carries beyond the expected date. On the other hand, in a mother who first shows anti-Rh titer *more than 14 weeks* before term, the probability that severe fetal damage will already be present by the time premature induction of labor is feasible is very great. It seems so great that the added risk to the fetus of prematurity and the added hazards to the mother of procedures for premature interruption of pregnancy would make unjustifiable the use of the latter. Those cases in which maternal Rh antibodies appear *between 10 and 14 weeks* before the expected date of confinement would require, in deciding upon premature termination of pregnancy, a nicety of judgment to which, unfortunately, clinical observation and laboratory findings can contribute little further information in the present state of our knowledge.

When the disease is suspected before parturition, for one or another of the reasons we have mentioned, special care should be exercised with

regard to analgesia and anesthesia during labor and delivery. No means should be practiced which reduces the oxygen carried by maternal blood, since the fetus, already struggling to overcome an impaired oxygen-carrying capacity of its blood, will thus be further embarrassed by hypoxemia.

All infants born to Rh-negative mothers should have immediate study of their blood: hemoglobin determination, red blood cell count, count of nucleated red blood cells, Rh determination, and A, B, O blood-group determination. The counts should be repeated at frequent intervals until the possibility of a progressive anemia is ruled out, and careful observation should be maintained for clinical evidence of the disease. In this connection it is important to bear in mind that one of the striking characteristics of hemolytic disease of the newborn is its tendency to manifest itself some days or weeks after delivery. Thus, an infant, apparently normal at birth, may suddenly develop a profound anemia which may go unrecognized if clinical and hematological alertness are relaxed. Moreover, almost all erythroblastotic infants tend to go downhill with increasing speed, and the resulting pathological changes may become irreversible unless treatment is prompt.

Transfusion is the principal method of treatment at the present time. In general, a red blood cell count of three million or less is an indication for it, while a count of two million or less indicates a very poor prognosis and is an urgent indication for transfusion. Routine transfusion, however, of all erythroblastotic babies at birth may subject some of them to unnecessary trauma. Those few cases which present, at the outset, normal newborn hemoglobin levels and red cell counts may suffer more damage from having extra blood crowded into their circulations than from the disease itself. It is advisable in such cases to postpone transfusion until blood studies indicate an actual need for it.

Where Rh incompatibility appears to be the etiology of hemolytic disease of the newborn almost all workers agree that Rh-negative blood should be given. If there is the slightest suspicion of other blood-group incompatibility, Group O blood should be used. Wiener¹⁵ states that when Rh-negative blood other than that of the mother is not available, her blood may be used for transfusion of the infant if the red cells are properly washed free of plasma and resuspended in compatible plasma. It might be safer to use maternal blood in this way only when it is Group O or group-compatible with that of the child.

Erythroblastotic infants should not be permitted to nurse, inasmuch as Rh antibodies are excreted in the mother's milk.

Whereas in the icterus gravis variety of hemolytic disease of the newborn replacement of blood is the principal rationale for transfusion, in the more deadly hydrops fetalis variety the added problem of marked hypoproteinemia is met.

While transfusion combats this to some extent, speculation may be entertained as to whether additional protein, or protein alone in those cases without marked anemia—plasma, for example—might be of value.

Many erythroblastotic infants manifest not only the anemia but also a bleeding tendency. The cause of the latter is unknown, though defective utilization of Vitamin K secondary to liver damage has been called in question. In general these infants do not lack Vitamin K. While its administration probably serves no useful purpose, it certainly can do no harm.

Oxygen therapy, particularly for the icteric and anemic group of infants, has proved to be of some value, especially if the red blood cell count is very low. Whether oxygen therapy to the mother during labor and delivery appreciably aids the fetus remains undecided.

As is evident from the mortality rates, our present treatment of hemolytic disease of the newborn leaves much to be desired. As would be expected from the present state of our knowledge, treatment is actually directed more at symptoms and signs of the disease than it is at causative pathological processes. One gains the impression, for example, that these infants die "liver deaths," that liver damage of various types plays a large part in the clinical picture. Yet at present there are no available treatment methods specifically designed to protect the fetal liver antepartum or to hasten its healing postpartum. Further work along these lines may well reward us with more adequate therapeutic procedures.

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FOR COMPLETE ROSTER OF OFFICERS, SEE ADVERTISING PAGE 4

NOTICES AND REPORTS

Council Meeting Minutes

Tentative Draft, Minutes of the 336th Meeting of the Council, California Medical Association

* * *

The meeting was called to order by Chairman Edwin L. Bruck at 9:30 A.M., September 8, 1946, at the Fairmont Hotel, San Francisco.

1. Roll Call:

Present were John W. Cline, President-elect; E. Vincent Askey, Speaker; L. A. Alesen, Vice-Speaker; Edwin L. Bruck, Council Chairman; L. H. Garland, Secretary, and Councilors Johnston, Crane, Henderson, Anderson, Kneeshaw, Kindall, MacDonald, Green, Cherry, MacLean, Moody, Thompson and Regan.

Present by invitation were C. L. Cooley, Secretary of California Physicians' Service; Dwight H. Murray, Chairman of the Committee on Public Policy and Legislation; Messrs Hartley F. Peart and Howard Hassard, legal counsel; Messrs. Clem Whitaker and Ed Clancy, Public Relations Consultants; Mr. William W. Bowman of C.P.S.; Mr. John Hunton, Executive Secretary; and Messrs. Robert F. Edwards and William P. Wheeler of the C.M.A. office.

A quorum was declared present and acting.

2. Approval of Minutes:

On motion duly made and seconded the minutes of the 198th meeting of the Executive Committee, June 29, 1946, were approved.

On motion duly made and seconded, the minutes of the 331st to 335th, inclusive, meetings of the Council, held May 6 to 10, 1946, were approved.

3. Membership:

(a) A report of membership as of September 6, 1946, was received.

(b) On motion duly made and seconded, 148 members whose 1946 dues had been received since the last Council meeting were reinstated as active members.

(c) On motion duly made and seconded, Doctors Robert O. LeBaron of Mendocino-Lake, William O. Weiskotten of San Diego, William E. Carter of San Francisco, and Earnest Dozier of Shasta County were elected to Retired Membership.

(d) On motion duly made and seconded, Doctors Harry E. Foster of Alameda, Olive B. Cordua and A. M. Lesem of San Diego, Philip A. Bearg of San Luis Obispo and Portia Bell Hume of Alameda County were elected to Associate Membership.

(e) Applications for Retired Membership from two Los Angeles County members who had not maintained active membership since 1943 were discussed and it was decided that the Los Angeles County Medical Association should be notified that the provisions of the Consti-

tution and By-laws must be followed and these applications denied.

4. Financial:

(a) Financial reports showing bank balances as of September 6, balance sheet as of August 31, 1946, and revenues and expenditures for the period ending August 31, 1946, were received.

5. Interim Appointments:

(a) The appointment by Executive Committee Chairman Shipman of Doctor E. L. Bruck and Messrs. Howard Hassard, Clem Whitaker, C. Ray Miller and John Hunton as a committee to select a surveyor to look into the business methods employed by California Physicians' Service was confirmed.

(b) Council Chairman Bruck announced the appointment of a committee composed of Doctors Hamilton Anderson, Nelson Howard, Walter Beckh, T. H. Kelly and Matt N. Hosmer, with John Hunton serving ex-officio, to pass upon advertising offered to CALIFORNIA MEDICINE. These appointments were confirmed.

On the subject of CALIFORNIA MEDICINE, it was moved by Cline, seconded by Alesen and unanimously voted that the Council express to Doctor Dwight L. Wilbur, Editor, its complete approval of the changes effected in the official journal and compliment him on his handling of CALIFORNIA MEDICINE.

(c) On a request from the California State Board of Nurse Examiners for the nomination of four physicians from whom two would be chosen as members of the Advisory Council to succeed Doctors John V. Barrow and Anthony B. Diepenbrock, terms expired, it was voted to authorize the Council Chairman to make such nominations.

(d) The Chairman announced his appointment of Doctor Verne Mason of Los Angeles to succeed Doctor Roy Thomas of Los Angeles, resigned, as a member of the standing Committee on Hospitals, Dispensaries and Clinics.

6. Advisory Planning Committee:

(a) Chairman Hunton reported that the Advisory Planning Committee had held its required meetings. The committee asked and was granted the appointment of two additional members, Joseph Donovan, Executive Secretary of the Santa Clara County Medical Society, and Kenneth Young, Executive Secretary of the San Diego County Medical Society.

(b) The committee called attention to the recently published report of the Assembly Interim Committee on Health Care and proposed that the findings of this committee should be kept alive and made the basis of a positive legislative program by the C.M.A. In this connection

the Advisory Planning Committee offered a three-point program: (1) That the C.M.A. have a positive program of health care legislation; (2) That the Assembly Interim Committee on Health Care report be made the basis of such a program, and (3) That the C.M.A. Executive Committee and Committee on Public Policy and Legislation confer as soon and as frequently as possible with the members of the Assembly Interim Committee on Health Care and with representatives of the State Department of Health in working out such a program.

After discussion it was regularly moved, seconded and voted that these recommendations be approved.

(c) The committee called the attention of the council to the formation of the Bay Area Coordinating Committee by the county medical societies in the San Francisco Bay area. The function of this committee is to implement and expand into neighboring counties the services of the Bureau of Medical Economics established by the Alameda County Medical Association, the function of which is to provide credit, collection and auditing services to the society members and to handle such affairs in a manner to build better public relations and to permit the county society to claim with complete assurance that medical care is available to all county residents at a rate which they can afford to pay. The committee endorsed this movement heartily and expressed such endorsement to the council.

7. Delegate and Alternate to American Medical Association:

Inasmuch as California is now entitled to an additional Delegate and Alternate to the American Medical Association, the Chairman called for nominations for such Delegate and Alternate, to serve until the next meeting of the C.M.A. House of Delegates. On nominations duly made and seconded, Lewis A. Alesen of Los Angeles was elected Delegate and Arthur A. Varden of San Bernardino was elected Alternate.

8. Public Policy and Legislation:

(a) Dwight H. Murray, Chairman of the Committee on Public Policy and Legislation, pointed out that the outlook for health insurance legislation in 1947 was heavily weighted against the profession because of the apparent approval of compulsory health insurance by some highly placed public officials and by large labor organizations. He suggested that the council-approved meetings with members of the Assembly Interim Committee on Health Care and representatives of the State Department of Health be held as soon as possible in order to provide the greatest possible time for working out a positive legislative program for the C.M.A.

Doctor Murray praised the growth of California Physicians' Service to more than 270,000 members but pointed out that even this enrollment out of a state population of close to 10,000,000 was not enough and would have to be augmented.

He suggested that the Council consider sending to England and possibly to France or other European countries a team composed of one physician and one economist. The purpose of such a trip would be to secure up-to-date information on (1) the collection and disbursement of funds under state health insurance systems, (2) the actual percentage of such funds which is eventually spent on direct medical care of beneficiaries, (3) whether or not the people under such systems are actually receiving good medical care, (4) whether or not the people are satisfied with the care they do receive, (5) whether or not the physicians rendering the care are satisfied with the conditions under which they furnish service, and (6) whether or not the type of medical students now being attracted to the medical schools constitute the type of student which would normally be acceptable in this state and country.

(b) Doctors Crane, Regan and Green, recently re-

turned from a meeting of the National Physicians' Committee in St. Louis, reported on the move by that organization to form local committees of physicians for the purpose of interviewing candidates for election and determining the attitude of such candidates toward health insurance proposals.

9. California Physicians' Service:

Doctor Chester L. Cooley, Secretary of C.P.S., reported to the Council the concern of C.P.S. Trustees over the higher expenses incurred by C.P.S. in following out the community enrollment campaigns which are a part of the C.M.A. public relations campaign. Reasons for the higher cost included the need of maintaining more representatives in the field, performing a more extensive enrollment procedure than usual, travel costs, office expenses, telephones, secretarial help and other items. Some modification in the enrollment drives has already been made and is estimated to reduce these higher costs in some degree.

He pointed out that the Trustees of C.P.S. believed that some of these additional costs should not be charged against the normal operating experience of C.P.S. but should be underwritten by the C.M.A. if the community campaigns are to be continued.

Concerning hospitalization, Doctor Cooley told of meetings recently held, looking toward the formation of a joint operating board by Hospital Service of California and Hospital Service of Southern California, under which the two hospitalization organizations would cooperate with C.P.S. and would offer one statewide hospitalization contract. Such a board has already been formed and C.P.S. hopes to effect operating economies under a program of cooperation.

Doctor Cooley also reported that C.P.S. had a membership of more than 270,000 on August 1, 1946, and during August had enrolled 31,000 new members, a new record month.

He requested that the business survey of C.P.S. be authorized and performed at the earliest possible date.

He also stated that there seemed a good chance of securing for San Francisco the central office of Associated Medical Care Plans, Inc., the corporation established by the American Medical Association to correlate the programs of the several state medical care plans and to enlarge existing plans and aid in the creation of new ones.

10. C.M.A. 1947 Annual Session:

The mail vote of the Council of June 4, 1946, on holding the 1947 Annual Session at Hotel Del Coronado was placed before the Council for confirmation. Executive Secretary Hunton reported on the facilities available at Del Coronado and at the major hotels of San Diego, pointing out that it would be necessary to arrange section meetings in two or possibly three places and that Hotel Del Coronado was not able to furnish meals for others than the guests of the hotel itself.

Doctor L. Henry Garland, Chairman of the Committee on Scientific Work, expressed concern over the need of arranging scientific programs in more than one place and stated that available dates for the 1947 session could be secured at the Hotel Biltmore in Los Angeles and the Palace Hotel in San Francisco. After discussion it was regularly moved, seconded and unanimously voted that the mail vote of the council of June 4, 1946, be rescinded and that the 1947 Annual Session be held at the Hotel Biltmore, Los Angeles, on April 30 and May 1 to 3, 1947.

11. Public Relations:

Mr. Clem Whitaker reported that voluntary health insurance campaigns have already been held in 15 counties and are now arranged in San Mateo, San Bernardino and Fresno counties. Editors of 152 newspapers have

been personally contacted in these campaigns and only one editor has declined to cooperate. Mayors of 49 cities have issued voluntary health insurance week proclamations and eleven members of the State Legislature have served as honorary chairmen for such weeks.

He stated that 25 county campaigns will have been completed by July 1, 1947, including Sacramento County in January, 1947, Alameda County in February, San Francisco County in March and Los Angeles County in June.

He stated his firm belief that public opinion toward the medical profession is considerably better today than two years ago. Financially, he reported that the campaign was considerably under the budget voted for 1946 and would finish the year at less than the budgeted figure.

After discussion it was regularly moved, seconded and voted that Mr. Whitaker be authorized to make such time arrangements for the C.M.A. radio program as may be most advantageous.

(b) A resolution of the Monrovia Branch of the Los Angeles County Medical Association, urging the use of additional pamphlets, was referred to Mr. Whitaker for consideration.

12. Palo Alto Clinic:

The request of the Santa Clara County Medical Association for a ruling by the Council on the propriety of the contract between the Palo Alto Clinic and Stanford University for the provision of medical services to Stanford students was next discussed. Doctor Russell V. A. Lee, senior partner in the Palo Alto Clinic, appeared, together with Mr. Arnold Rumwell, Clinic Attorney, and Mr. John Stahlaker of Stanford University.

Doctor Lee stated that the contract has now been in effect for five months and is satisfactory to the University, to the students and to the physicians rendering the service. Overhead expenses, he said, amount to only ten cents per month per student, the balance of all funds going to the physicians. He stated that the Clinic and Stanford University both believe that under this contract the students are receiving the best medical service they have ever had.

Referring to a legal opinion furnished by C.M.A. legal counsel and referring particularly to Article VI, Section 3, of the "Principles of Medical Ethics" of the American Medical Association, Doctor Lee discussed the seven features of contract practice which could make such practice unethical. On No. 1, (solicitation of patients) he stated there had been no solicitation by the Palo Alto Clinic. On No. 2 (underbidding to secure contract) he stated there had been no other bid for this service and hence no underbidding. On No. 3 (adequacy of payment to insure good medical service) he stated that good medical care is provided and that the physicians performing the service are satisfied with their compensation. On No. 4 (interference with reasonable competition in the community) he offered to make available to the Stanford students the services of any physician they might select, provided such a procedure would be legal and provided the physicians selected were approved by the medical director of Stanford University. This, he felt, would eliminate any question of interference with reasonable competition. On No. 5 (prevention of free choice of physician) he stated that under the present contract the students' choice is limited to the twenty-six physicians comprising the Palo Alto Clinic. He stated that the University interfered to some extent in this situation because some poor results had previously been encountered from free choice and the University felt a responsibility to provide the "best" medical service to its students. He stated his willingness to permit free choice of physicians who were approved by the medical director of the University and to permit the payment of such physicians by the University and the deduction of such payments from the sums due the Palo

Alto Clinic under the contract. On No. 6 (rendering of adequate service to patient) he stated he welcomed an investigation of the service being rendered under this contract. On No. 7 ("contrary to sound public policy") he stated that such determination was vague and stated his belief that sound public policy was being followed.

Doctor Lee stated that Stanford University had four choices open to it in drawing up a student medical care program: It could (1) do nothing and allow the students to shift for themselves, (2) secure a full-time salaried staff of physicians, which it was unwilling to do because it felt the proper quality of men and service could not be secured, (3) contract with California Physicians' Service, which he stated was discussed by the University with C.P.S. but rejected because C.P.S. could not supply the 24-hour service, nursing service, athletic medical care and other features desired by the University, or (4) contract with the Palo Alto Clinic for all services desired.

Doctor Lee offered to answer any questions, either himself or through Mr. Rumwell or Mr. Stahlaker, and various questions were asked and answered.

Doctors Charles Fernish, Fred Borden and John Hunt Shephard, representing the Santa Clara County Medical Society, were then called upon. Doctor Shephard criticized the contract as a step in opposition to the private practice of medicine, pointed out that there is a difference between a student health service and curative medicine and stated that if the panel were opened to permit students to select their own physician, the free choice of physician would still be impaired because of the fact that the medical director of Stanford University is also a partner in the Palo Alto Clinic and could not be considered an unbiased judge because of that affiliation.

Doctor Burt L. Davis, Jr., of Palo Alto stated his belief that the University should permit the students a free choice of physician and should maintain records of payments to physicians on a unit basis, paying both clinic members and others on an equal basis, figured periodically.

Doctor H. T. Browne of Palo Alto stated his belief that medical opinion would not approve of the University medical director also serving as a member of the Palo Alto Clinic.

At this point the council went into executive session.

13. Legal Department:

(a) Mr. Hassard reported that the Industrial Accident Commission had agreed to permit the insurance carriers to appear before it on September 17 to discuss the adoption of the fee schedule approved by the Commission on June 18, 1946. The C.M.A. will also appear at that time.

(b) Doctor MacDonald reported on conference with the California Unemployment Stabilization Commission relative to the adoption of sound medical procedures and simplified report forms to be used in connection with the Sickness Disability Law adopted by the 1945 session of the Legislature. He requested approval of a schedule of fees for examination of doubtful cases and suggested that the appropriate fees in the C.M.A.-sponsored industrial fee schedule be used. This calls for \$7.50 for a routine examination, \$15 for a more thorough examination by a specialist and \$25 to \$50 for a complete examination, together with a review of the record, by a specialist. On motion duly made and seconded, it was voted that such a fee schedule should be approved for transmittal to the Unemployment Stabilization Commission, with the understanding that charges for laboratory services or other special diagnostic procedures would not be included in such fees.

Doctor MacDonald also asked for suggestions for a medical director for this work at a salary of \$7,500 annually. Several names were suggested, these to be sent by the C.M.A. to Doctor MacDonald for delivery to the State.

14. California Physicians' Service: (Second appearance)

Mr. Bowman called attention to the request made earlier by Doctor C. L. Cooley that the C.M.A. underwrite the additional expenses to C.P.S. in the community campaigns particularly since such expenses are not ordinary business expenses and should be considered as public relations expenses of the C.M.A. On motion by Kneeshaw, seconded by Kindall and amended by Cline with the approval of the mover and seconder, it was voted that C.P.S. be reimbursed by the C.M.A. for approximately

\$5,700 of such additional expense already incurred and that similar expenses be met by the C.M.A. until further consideration is given this matter at the next Council meeting.

15. Time and Place of Next Meeting:

It was agreed to hold the next council meeting at the time and place selected by the chairman, with the understanding that the fall meeting is by custom held in Los Angeles.

16. Adjournment.

California Physicians' Service — Public Relations

"Make the California Physicians' Service as simple and efficient as possible—and let the public know it."

With the statement as a criterion, the California Physicians' Service one year ago established a new department within the organization: the Department of Public and Professional Relations.

The need was imminent. C.P.S. since 1939 had grown into a California landmark of free enterprise. A nationally recognized plan for the prepayment of medical service, its tremendously accelerated growth called for departmental liaison between the medical profession and beneficiary members. Specifically required was the proper dissemination of technical and general information to the physicians, members and the public. Additionally, the Department's activities were slated to set up an always available question and answer bureau for claim filers. Most important, the Department would be charged with preserving a favorable attitude toward the California Physicians' Service by the physicians and the public.

Today, the Department of Public and Professional Relations, with central offices in San Francisco and Los Angeles, can point with a measure of pride to some of the past year's accomplishments.

Reflecting the considered and growing need for expansion within the department, two more offices (San Jose and San Diego) have added full time public and professional relations personnel to their staffs. This is another step toward providing on-the-spot answers to the problems and questions of physicians and nurses.

In any program developing as rapidly as C.P.S., where the unpredictable human element is such an important factor, questions and misunderstandings are bound to arise. Unless prompt action and counsel is available, the problem can grow into proportions which eventually will lead to an irreparable rift. To iron out such difficulties, professional relations men provide the "in-between" touch.

Relatively, the California Physicians' Service is new—and controversial. Staff personnel are emphasizing that here is a high type of medical care program operating successfully and with the backing of more than 7,400 family doctors. At the same time, no small part of their efforts is directed toward arousing public antipathy over the social and public dangers of compulsory health insurance.

Advocates of state medicine are increasing their efforts statewide and nationally. The 1947 meeting of the State Legislature may see a renewal of the bitter fight for compulsory health insurance. The Truman-approved Wagner-Murray-Dingell Bill has been approved by the Senate Education and Labor Subcommittee on Health and Education.

Finding that voluntary health insurance plans were inadequate to meet "all of the requirements of the nation," the subcommittee's report concluded:

"To cover everyone, the adverse as well as the good risks, the young and the old, the sick and the well, the rural and the city dwellers, the low and the high income

groups, the poor and the rich areas, all this takes a mechanism as representative and all-inclusive as a national health program, built around a system of prepaid medical care."

The report concluded that such a system must be financed by "required contributions to the social-security fund and by payments from general tax revenues."

The Public and Professional Relations staff is in the forefront of the battle against this evident attempt at regimentation of the medical profession. In every service club, fraternal organizations and in rural schoolhouses, staff speakers are hammering at the theme: "The California Physicians' Service, or any form of voluntary health insurance, can give the public a more economical and broader plan of coverage than could any politician under any system of government controlled medicine!"

Perhaps to the title, "public and professional," could be added "political." While promoting better physician-patient relations within the organization, staff personnel know and emphasize that this is also a political battle.

In January of this year, the Department of Public and Professional Relations joined forces with the Whitaker-Baxter organization, public relations counsel for the California Medical Association, in coordinating an impressive radio and advertising campaign. Under the direction of the Whitaker-Baxter staff, public speeches, radio and newspaper publicity, pictures, and advertisements are acquainting the California public as never before with the worthwhileness of C.P.S. benefits in particular and voluntary health insurance in general.

C.P.S. physician-members especially are rallying to the defense of good medicine and are proving to the public that they can bring their system of medical economics into pace with the rapid advance of their medical science.

Increased enthusiasm throughout the entire Service was evidenced recently when the State Supreme Court ruled that C.P.S. was not subject to regulation by the Insurance Commissioner. Particularly applicable, from the professional relations standpoint, was the Court's conclusion: "Probably there is no more impelling need than that of adequate medical care on a voluntary low cost basis. The medical profession, unitedly, is endeavoring to meet that need. Unquestionably, this is a service of a high order and not indemnity."

Telling California's 9,000,000 citizens about this "service of a high order" is part of the responsibility of the Department of Public and Professional Relations. The department is looking forward to the day when district offices will each have a representative on the spot to provide immediate service to physicians, members, and the public.

When the present quarter million membership has passed the million mark, this department may take pride in declaring:

"The California Physicians' Service is as simple and efficient as possible—and the public knows it!"

[Roster of C.P.S. officials is printed on advertising page 3.]

NEWS and NOTES

NATIONAL • STATE • COUNTY

ALAMEDA

Permanente Foundation, which operates a pre-paid medical care service, has bought the 123-room Piedmont Hotel in Oakland, not far from the old Fabiola Hospital which was taken over by the Foundation several years ago. The hotel property, purchase price of which is reported at about \$200,000, will be used as a nurses' home and training center. Although Permanente Foundation was set up originally by Mr. and Mrs. Henry J. Kaiser to provide medical care for workers in Kaiser enterprises, it is reported that at present some 85 per cent of patients are not Kaiser employees.

DEL NORTE

The California Medical Association is ready to assist Del Norte County financially in setting up a cancer detection clinic at Crescent City. Mrs. Ralph Luick reported to the county board of supervisors upon her return from the annual meeting of the California Cancer Society in San Francisco. Mrs. Luick, commander of the county Cancer Society, reported also on the substantial program organized by the national and state Cancer Society units for the necessary early detection of cancer.

GLENN

Plans for a health unit to be financed by Glenn and Colusa counties have been rejected by the Glenn County board of supervisors. A spokesman for the supervisors said that the board was looking toward construction of a new county hospital and was reluctant therefore to spend money on the proposed bi-county health unit.

LOS ANGELES

Dr. Arthur J. Moss is now associated with Dr. Lawrence M. Hill in the practice of pediatrics in Inglewood. Dr. Moss, a graduate of the University of Minnesota, spent 22 months in Australia, New Guinea, Luzon and Japan with the U. S. Army Medical Corps.

Dr. Homer Rosenberger, Jr., has returned to Whittier to the practice of medicine after serving four years as Chief of Medical Service in the U. S. Army Air Corps Station hospitals. Dr. Rosenberger, a graduate of Stanford University Medical School, is the son of the late Dr. H. G. Rosenberger, prominent Whittier surgeon for 30 years.

Dr. Russell W. Starr, Los Angeles physician, was elected commander of the Fourth Area, Department of California, American Legion, at its convention in San Francisco. The Fourth Area comprises seven Legion districts—in Santa Barbara, San Luis Obispo, Ventura and Los Angeles counties. Dr. Starr has been a member of the Legion since its inception and has represented it on many civic committees in Los Angeles.

Dr. Nathan Jacobs now occupies the new medical building at 80 West Sierra Madre Blvd., Sierra Madre. Dr. Jacobs, who spent two and a half years in military service, had previously practiced in Sierra Madre.

Dr. Mary B. Dale, 1035 East Howard Street, a member of the Los Angeles county health department medical staff, has been appointed epidemiologist for the department according to Dr. Roy O. Gilbert,

acting county health officer. Dr. Dale is the first woman to hold such a position in Los Angeles County.

Dr. S. H. Welch, whose offices were in the Security Building, Glendale, retired from practice on August 1. The eye, ear, nose and throat specialist had been in practice 41 years.

Dr. Russell O. Spittler has become associated with Dr. W. J. Tennison in the practice of general surgery with offices at 38 E. Huntington drive. Dr. Spittler, who was recently discharged from the medical corps of the U. S. Army, is also on the staff of St. Luke's Hospital in Pasadena. He is a graduate of Minnesota Medical School.

Dr. Mark Giffords, recently discharged from the U. S. Army Medical Corps, has opened offices at 8730 El Manor Ave., Westchester. Dr. Giffords graduated from Boston University School of Medicine in 1935 and served internships at Madison, Wisconsin, and Perth Amboy, New Jersey.

Dr. Harold M. Walton has been appointed medical superintendent of White Memorial Hospital. He succeeds Dr. Orlyn B. Pratt, who has been called to head the department of pathology for the College of Medical Evangelists, Loma Linda and Los Angeles.

Dr. Howard F. West was elected president of the American Heart Association to succeed Dr. Roy W. Scott of Cleveland, the Association announced. Dr. West was one of the founders of the Los Angeles Heart Association and the California Heart Association. He has served as president of both groups. A graduate of Stanford University School of Medicine, he now serves as clinical professor of medicine in the University of Southern California School of Medicine. He is president of the Los Angeles Academy of Medicine, chairman of the Medical Advisory Committee of General Hospital, member of the board of directors of both the Los Angeles County Tuberculosis and Health Association and Combined Christmas Seal Fund and a member of the Health Service Committee of the Welfare Council of Metropolitan Los Angeles.

Courses in public health and public health nursing will be included in the new fall schedule of evening courses which University of California Extension will open in downtown Los Angeles in late February according to Miss Margaret Wotton, Class Organizer.

Dr. K. H. Sutherland, District Health Officer for the Los Angeles County Health Department will conduct a course in Public Health and Preventive Medicine, scheduled to open Wednesday evening, September 25 at 7 o'clock for 18 weekly meetings.

ORANGE

Dr. Joseph A. D'Alessio has established his medical and surgical offices in more spacious quarters, at the Palm Springs Medical-Dental Centre, 244 South Palm Canyon Drive. Dr. D'Alessio has been in private practice in Palm Springs since his discharge from the United States Army Medical Corps.

SACRAMENTO

Hilding R. Johnson, M.D., has announced the opening of his new offices at 2100 Capitol Avenue, Sacramento.

SAN DIEGO

Dr. S. J. McClendon, San Diego pediatrician and president of the California Medical Association, at the invitation of the Brazilian government, read a paper on rheumatic fever at the first **Inter-American Medical Congress at Rio de Janeiro** early in September. The congress is sponsored by the Academy of Medicine at Rio de Janeiro in cooperation with the Brazilian and United States governments and the U. S. Public Health Service.

SAN FRANCISCO

Dr. William J. Kerr, professor of medicine, and Dr. John J. Sampson, associate clinical professor of medicine of the University of California Medical School, will deliver papers to the **Second Inter-American Congress of Cardiology in Mexico City**, meeting from October 6 to 12. Dr. Theodore Althausen, associate professor of medicine at the same school, recently returned from Mexico City where he delivered a scientific paper before the **First Mexican Medical Congress**.

Plans for the **Maimonides Health Center** for the chronic sick, on which construction is expected to start next year, will be drawn by Eric Mendelsohn, architect, it is announced by Joseph M. Bransten, chairman of the building committee.

The health center, which is to cost an estimated \$575,000, will be located on **Sutter Street near Mount Zion Hospital** so that the hospital's facilities may be used. It is said to be the first center for care of the chronic sick of the Pacific Coast.

SAN LUIS OBISPO

Dr. H. O. Swartout, internist, has announced the opening of a medical office at 412 North Broadway, **Santa Maria**. Formerly on the staff of **White Memorial Hospital**, Dr. Swartout was also Health Officer for Los Angeles County.

SAN MATEO

Twenty-six rooms in **San Mateo County's Community Hospital** which could be used for patients cannot be opened because of a **shortage of nurses**, according to Dr. Harold Raycroft, recently appointed hospital director. He said that 14 more nurses would be needed if the rooms are to be put into use.

The director said that although the hospital with its present staff does not have to turn away patients who need medical attention, if the additional nurses were available some patients could be kept longer and it would not be necessary to draw such fine distinctions as to who does and who does not need hospitalization.

Requirement that the county health director be a California licensed physician is one of a number of San Mateo County charter changes which are proposed for submission to voters in the general election next November.

SANTA BARBARA

Centralization of the facilities of **Santa Barbara County General Hospital** was recommended by Dr. Philip K. Gilman in a report following a survey which he made as chief of the Bureau of Hospital Surveys of the California State Department of Health. Recommendations included one to construct a multi-story main building to house facilities now scattered in small units over the extensive grounds, which are several miles outside the city limits of Santa Barbara. Possibility that the County Health Department might be quartered at the hospital rather than in the court house also was suggested by Dr. Gilman.

SONOMA

Dr. William J. Rudee, recently discharged from the Navy, has opened temporary offices at 1055 Fourth street, **Santa Rosa**, where he will resume his practice until more centrally located office space is available. Before entering the service, Dr. Rudee was a practicing physician and surgeon in Santa Rosa.

Dr. J. A. Fowlie has sold his office in **Cotati** and announced that hereafter he will devote all his time to his Santa Rosa office.

Dr. Marian B. McAulay has opened a new office at 226 Washington Street, in **Petaluma**.

YOLO

Dr. W. J. Blevins, Jr., has announced the proposed construction of a \$30,000 Physicians' building in **Woodland**. Construction probably will start late this year or early in 1947, Dr. Blevins said. The structure will house Dr. Blevins' offices and those of Dr. John O'Hara, who now practices in the Porter Building.

Dr. W. J. Blevins, Sr., recently retired from practice after suffering a heart attack. His condition now is reported greatly improved.

GENERAL NEWS

Surplus medical equipment, for purchase of which veterans of World War II can obtain priority, is listed in a catalog put out by the War Assets Administration. Catalogs and information as to how to apply for purchases are available through two regional offices of the WAA in California. In **Los Angeles** the address is: George F. Ballif, Jr., Regional Director, War Assets Administration, Mode o' Day Building, Hill Street and Washington Boulevard. Los Angeles office telephone number is Richmond 2311. The **San Francisco** address is Leland D. Dedo, Regional Director, War Assets Administration, 30 Van Ness Avenue, and the telephone number is Underhill 2425.

California has been allotted **\$185,820** for hospital survey and planning and \$1,957,875 for construction under the five-year hospital construction program authorized in the federal Hospital Survey and Construction Act, according to figures released by Surgeon General Thomas Parran of the United States Public Health Service. The act authorizes appropriation of \$3,000,000 for surveys and \$75,000,000 annually for five years for hospital construction in the United States.

Three evening courses in graduate medicine are being offered this fall by the University of Southern California School of Medicine. A course in **Quantitative Methods in Medicine**, beginning October 2, will be conducted by Frederick Moore, M.D., and associate. Lectures each Wednesday evening for 12 weeks will cover the collection, analysis, interpretation and presentation of medical data. Travis Winsor, M.D., will conduct a course in the **Clinical Aspects of Electrocardiography**. The course begins November 5, and meetings will be each Tuesday evening for 12 weeks. A course in **Cardiovascular Diseases**, under the direction of George C. Griffith, M.D., and associates, began September 16. Meetings are Monday evenings for 12 weeks.

Inquiries should be addressed to Director, Division of Graduate Medicine, School of Medicine, University of Southern California, Room 2721, Los Angeles County Hospital, Los Angeles 33, Calif.

Dr. John Parkinson, National Heart Hospital, London, and Dr. Helen B. Taussig, Johns Hopkins Hos-

pital, Baltimore, will be the guest speakers at the annual symposia of the **California Heart Association** to be held in San Francisco, Los Angeles and San Diego, October 16 through 25.

Dr. Parkinson is consulting cardiologist to the Royal Air Force and was chief assistant to Sir James Mackenzie before World War I. He is in charge of the Cardiac Department of the London Hospital and of the National Heart Hospital. Among Dr. Parkinson's topics will be recent developments in cardiac radiology and a discussion of rheumatic fever.

Dr. Taussig and her associate, **Dr. Alfred Blalock**, are noted for their successful treatment of congenital heart disease. Dr. Taussig will report on the conception and development of the surgical treatment of congenital heart disease.

Physicians may register for the symposia at the following addresses: San Francisco, October 16-19, San Francisco Heart Committee, 604 Mission Street, San Francisco 5, California. Los Angeles, October 23-25, Los Angeles Heart Association, 117 West 9th Street, Los Angeles 15, California. Registration for the San Diego meeting, October 21, can be made through the San Diego County Medical Society.

The American Legion of California, at its August convention in San Francisco, **reaffirmed its 1945 opposition to compulsory health insurance** legislation with a warning against increased tax burdens and regimentation of the medical profession.

Recalling that its Rehabilitation Commission, responsible for the rights and welfare of disabled wounded service men, had protested last year against proposed plans for compulsory health insurance, the Legion's resolution declared that California's more than 1,000,000 veterans who have served in the armed forces now have available to them hospital and medical care provided by the United States Government. Pay roll deductions that may be forced on the veteran to pay for compulsory health insurance would be **"a cost for services already supplied."**

Calling attention to the "countless voluntary health insurance plans now being offered by the physicians and the insurance companies," the Legion's resolution, brought to the floor by national executive committeeman Leon Happell, Stockton, declared:

"Proposed plans of compulsory health insurance would increase the tax burden and bring about regimentation of the medical profession."

The Legion resolution concluded with the statement that **all forms of compulsion are incompatible with our American way of life** "since our liberties and opportunities would be circumscribed."

The 5,000 convention delegates represented approximately 170,000 California Legionnaires.

Publication of a new journal, the Quarterly Review of Dermatology and Syphilology, has been announced by the Washington Institute of Medicine, Washington, D. C. The new publication will survey all published material on Dermatology and Syphilology appearing anywhere in the world from January 1, 1946, onward. **Donald M. Pillsbury, M.D.**, is editor-in-chief, with **Herman Beerman, M.D.**, and **Clarence S. Livingston, M.D.**, as associate editors. The editorial board includes specialists from universities and medical centers throughout the world. The complete board will be announced by Dr. Pillsbury in the near future.

In Memoriam

Austin, Lloyd Crockett. Died at Los Angeles, July 3, 1946, age 53. Graduate of the St. Louis University School of Medicine, Missouri, 1928. Licensed in California in 1928. Doctor Austin was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.



Beck, Homer Henry. Died at Corning, July 21, 1946, age 61. Graduate of the Jefferson Medical College of Philadelphia, Pennsylvania, 1910. Licensed in California in 1919. Doctor Beck was a member of the Tehama County Medical Society, the California Medical Association, and the American Medical Association.



Davies, Benjamin Paul. Died at Palo Alto, July 8, 1946, age 41. Graduate of the University of Kansas School of Medicine, Lawrence-Kansas City, 1931. Licensed in California in 1938. Doctor Davies was a member of the Santa Clara County Medical Society, the California Medical Association, and the American Medical Association.



Jacobs, Louis Olive. Died at San Francisco, April 29, 1946, age 66. Graduate of the University of California Medical School, Berkeley-San Francisco, 1904. Licensed in California in 1904. Doctor Jacobs was a member of the San Francisco County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.



Kemper, Christian Arthur Schultz. Died at Escondido, July 13, 1946, age 63. Graduate of the Medico-Chirurgical College of Philadelphia, 1908. Licensed in California in 1920. Doctor Kemper was a member of the San Diego County Medical Society, the California Medical Association, and the American Medical Association.



Libby, Arthur A. Died at Pasadena, July 23, 1946, age 81. Graduate of the University of Southern California School of Medicine, Los Angeles, 1897. Licensed in California in 1897. Doctor Libby was a Retired Member of the Los Angeles County Medical Association, the California Medical Association, and an Affiliate Fellow of the American Medical Association.



McDaniel, John Lavender. Died at San Fernando, July 20, 1946, age 63. Graduate of the University of Georgia School of Medicine, Augusta, 1883. Licensed in California in 1909. Doctor McDaniel was a Retired Member of the Los Angeles County Medical Association, and of the California Medical Association.



Silvia, Clara Agnes. Died at Gilroy March 13, 1946, age 69. Graduate of the College of Physicians and Surgeons, San Francisco, 1903. Licensed in California in 1903. Doctor Silvia was a member of the Santa Clara County Medical Society, the California Medical Association, and the American Medical Association.

INFORMATION

COURT HOLDS C.P.S. NOT SUBJECT TO INSURANCE LAWS

California Physicians' Service is a service corporation, it is not subject to restrictive laws governing insurance companies and its operations are not under supervision of the California Insurance Commissioner. This is the import of a decision by the California Supreme Court, announced late in August, successfully climaxing for C.P.S. an action at law which that organization had begun in San Francisco Superior Court in 1940.

When C.P.S. was formed in 1939 as a service corporation, the insurance commissioner objected and contended that it was in reality an insurance company and subject to all of the restrictive laws governing insurance. Counsel for C.P.S., Hartley F. Peart and Howard Hassard, advised both the California Medical Association and C.P.S. that in their opinion the rendering of medical care on a prepaid basis through a service corporation in which all doctors of medicine were free to participate, was a professional matter and not an insurance business.

Accordingly, C.P.S. commenced an action against the insurance commissioner for a declaratory judgment. The suit was commenced in 1940. In it C.P.S. sought a judgment of the court establishing its legal right to engage in a prepaid medical service plan. The case was heard by Judge C. J. Goodell, then of the Superior Court in San Francisco, and was decided in favor of C.P.S. The insurance commissioner appealed. The case finally reached the California Supreme Court, and on August 27, 1946, the Supreme Court in an opinion written by Justice Douglas Edmonds decided in favor of C.P.S. and against the insurance commissioner. Six of the seven justices of the California Supreme Court concurred in the main opinion, and one justice concurred in a separate opinion.

As the decision of the Supreme Court is one of first impression, it is a milestone upon the path of voluntary prepaid medical care. Its major features, with certain portions of the opinion and footnotes summarized, follow:

California Physicians' Service, a non-profit corporation (Civ. Code sec. 93-605e), sued to obtain a declaratory judgment that it is not engaged in the business of insurance within the meaning of the regulatory statutes of this state. The insurance commissioner has appealed from a determination adverse to his contentions, and the principal question for decision concerns the organization's right to operate, without his supervision, for the purpose of defraying the expense of medical care incurred by its dues-paying members.

The stipulation by which the evidence in the case was presented to the trial court shows the following facts:

The corporation was organized by the medical profession in 1939 to meet the need of persons in the lower income groups for medical care and surgical service. It holds a certificate of compliance with the provisions of section 593a of the Civil Code, relating to health service corporations, issued by the State Board of Medical Examiners. The incorporators were all officers and councilors of the California Medical Association, an association comprising over 5,000 doctors of medicine practicing in the State of California and constituting a component state unit of the American Medical Association. The Service is a pioneer attempt by the physicians and surgeons of California to make available medical care for those who desire it and, because of financial limitations find the cost of sickness a burden not easy to bear.

The articles of incorporation state that the organization was formed "after more than ten years of continuous investigation and study." As a summary of policies and purposes, it is said "that the duties and obligations of the profession are not only leadership in the maintenance of high standards of medical service but also in the means of distribution of that service so that all who need it may receive it; that the very advances made by modern science have greatly increased the cost of good medical service and hospital care and will continue to increase that cost as new methods and equipment for diagnosis and treatment are discovered and perfected . . . that a method which only the medical profession can most effectively provide is necessary properly to distribute this cost of medical service so as to relieve the intolerable financial burden heretofore falling on the unfortunate few in any given period of time; that the establishment by the profession of a voluntary medical service plan, participated in by all doctors of medicine desiring to do so, will enable the people of the State of California to obtain prompt and adequate medical attention and hospital care whenever needed on a periodic budgeting basis without injury to the standards of medical service, without disruption of the proper physician-patient relation and without profit to any agency, and will assure that all payments made by patients, except administrative costs, will be utilized for medical service and hospital care and not otherwise; that such a plan will create an efficient public and civic service without commercial exploitation of the patients or the profession or any restriction of an individual's fundamental right freely to select, when his need arises, the doctor of medicine and hospital desired by him; and finally, such a coordinated organized service can, upon the same fundamental basis, be the means which governmental agencies—federal, state, and local—may use to provide, at the lowest possible cost to the taxpayer, good medical service and hospital care for the indigent, needy or handicapped residents of California. . ."

To make effective these broad objectives, the by-laws declare that every resident doctor of medicine who holds "a valid and unrevoked physician's and surgeon's certificate issued to him by the Board of Medical Examiners of the State of California shall be invited by the board of trustees to become a professional member . . . it being one of the fundamental purposes of this corporation that professional membership . . . shall embrace all legally licensed Doctors of Medicine . . ." The professional members select, on a basis of state-wide representation the administrative members, limited to 75, each of whom must be an active member in good standing of the California Medical Association. The voting rights in the corporation are vested in the administrative members exclusively. They elect the directors who are designated as trustees.

The persons who are to receive medical attention from the professional members "on a periodic budgeting basis" are termed beneficiary members . . . (the court describes in detail the contracts with beneficiary members) . . .

The Rural Health Service Agreement which the corporation made with the Farm Security Administration, an agency of the United States, contains substantially the same terms as those of the Group Medical Service Agreement, but there are additional provisions for hos-

pitalization and reimbursement for drugs. Although it is stated in the preamble of this agreement that it is of an experimental nature and binding only for a specified period, the stipulation of facts recites that it "has been adopted by California Physicians' Service and is in use at the present time."

. . . (Rural Health Service Agreement is summarized) . . . Each professional member agrees, by written contract with the corporation, to render such needed medical attention to beneficiary members as may properly be requested of him and, for the payment of compensation for such services, to look solely to the available funds of the organization. But every physician "is free to exercise his individual right to refuse to accept any person as a patient." The amount to be paid to a physician is determined by what is known as a unit system, and each professional member agrees to accept as payment in full for his services rendered to beneficiary members during each month a pro rata distribution of that portion of dues collected during such month.

The by-laws describe the unit system and its operation as follows: "By the term 'unit system' is meant a method of computing the compensation due to professional members rendering medical or surgical services whereby a proportional valuation is set upon each kind of service by counting each such service as a determined number of units by resolution of the board of trustees adopting a schedule or schedules of compensation. The total sum of money available for compensation of professional members is divided by the total number of units of service rendered during any given period to determine the monetary value of a single unit for the purpose of compensation earned by professional members and each professional member is paid according to the number of units of service he has rendered in said period. . . .

"In the event that during any period there is available for payment to professional members a sum in excess of the sum necessary to pay the full schedule or compensation established by the board of trustees such excess sum shall be reserved by the board of trustees as a part of the reserve funds of the corporation or if the board of trustees so determines, it may be distributed on a unit system to those professional members who have in any prior period determined by the board received for their services less than the compensation schedule, provided no professional member shall thereby receive more than the full compensation schedule for any service rendered."

Upon this evidence the trial court decreed as follows:

"That rendition of medical and surgical services by the professional members of . . . California Physicians' Service, and the acceptance of payment for such services . . . from funds contributed by the beneficiary members" of the organization "does not constitute the transaction of an insurance business under the insurance laws" of this state. More generally the court declared that the "objects and purposes set forth in the articles of incorporation" of the Service "are lawful objects and purposes and the performance or undertaking by plaintiff of any or all of said objects does not and will not violate any . . . laws of the State of California relating to the business of insurance." Concerning the medical attention which the members receive, the decree recites that "the rendition of medical and/or surgical services . . . does not constitute a violation of the principle that a corporation may not engage in or be licensed to practice one of the learned professions . . ." But the court declared that the collection of money "to be used in the manner and for the purposes outlined in the articles of incorporation of the plaintiff" subjects it to regulation by the Attorney General of California in accordance with the provisions of section 605(c) of the Civil Code relating to non-profit corporations.

As grounds for reversal of the judgment, the insurance commissioner declares that the courts should not place judicial approval upon a controversial type of new business enterprise; also that in the absence of specific statutory authority for declaratory relief against the state or an officer of the state such an action cannot be maintained. The term "person" as used in section 1060 of the Code of Civil Procedure, it is urged, does not include the state or its officers because general words in a statute which might have the effect of restricting governmental powers are to be construed as not applying to the state, and declaratory relief is not available against political subdivisions of the state.

Another contention of the commissioner is that the Service's activities constitute the unlawful practice of medicine by a corporation. Furthermore, he says, section 593a of the Civil Code specifying certain minimum requirements which a health service corporation must meet, and a statute authorizing political subdivisions of the state and public agencies to contract with a non-profit membership corporation for medical service (Stats. 1939, Ch. 250; Deering Gen. Laws 1943, Act 3725) are invalid. These enactments, it is claimed, make an unreasonable classification because the grant of the privilege of corporate practice, based upon the number of licensee members of the corporation, is not related to qualification or fitness. Also, the argument continues, no subsequent legislation has authorized the activities of the Service.

The major ground for the attack upon the judgment is that the Service is engaged in the business of transacting insurance and therefore is subject to the regulatory laws governing such corporations. All of the elements of insurance are present in the Service's plan, says the commissioner. There is no real distinction between service and insurance, and by its contracts the corporation has obligated itself to furnish medical care. The Service's plan of operation is not excepted by statute from the supervision of the insurance department, and the Service is not a consumer cooperative, but a corporation organized for the profit of the professional members. The nature of the medical service, and of the contracts it offers, require the application of the insurance laws to its affairs in order to prevent exploitation of the public. Finally, the commissioner asserts, the judgment goes beyond the stipulated facts in prospectively validating future acts not comprehended in the Service's plan of operations as conducted at the time the decree was entered, and its method of doing business since the notice of appeal was filed shows the necessity for state insurance regulation.

In response to the contentions of the attorney general the Service asserts that declaratory relief is a proper form of action against the insurance commissioner. Also, it replies, the Service is not engaged in the corporate practice of medicine; if so, its functions are expressly permitted by statute.

Turning to the most important question, the Service declares that it is not engaged in the insurance business but is rendering personal service, as distinguished from indemnity, compensation for which is limited to the resources of a pooled fund; that the professional members, not the Service, assume any and all risk; and that it is actually a producer-consumer cooperative. Furthermore, the Service concludes, as a matter of social policy the state, by statute, has declared that a non-profit membership corporation may lawfully defray or assume the cost of medical and surgical services or render any such service. In that regard the argument runs, the legislature has necessarily determined that the rendition of medical and surgical services by a non-profit membership corporation coming within the purview of section 593a of the Civil Code does not constitute that type of insurance assuming it is insurance which is subject to regulation by the

insurance commissioner. In conclusion, the Service maintains that the legislative classification under the applicable code provisions is constitutional.

... (the Court reviews prior cases and decides that a declaratory judgment action is proper) ...

Considering the merits of the case, it is a matter of common knowledge that there is great social need for adequate medical benefits at a cost which the average wage earner can afford to pay. Unquestionably the distribution of these services has lagged far behind production. During the past several decades many plans have been devised to distribute the cost of medical care (see: *People v. Pacific Health Corp.*, 12 Cal. 2d 156; *Butterworth v. Boyd*, 12 Cal. 2d 140; *Pacific Employers Ins. Co. v. Carpenter*, 10 Cal. App. 2d 592; 52 Harv. L. Rev. 809-817) and in 1917, the California legislature adopted a constitutional amendment calling for the creation of a system of state medicine financed through taxation (Stats. 1917, p. 1948). This amendment was rejected by the people.

In 1935, similar legislation met defeat. The medical profession then undertook the responsibility for providing medical service on an ability-to-pay-for basis, and it is obvious that the legislature, by enacting section 593a of the Civil Code,¹ expressly authorized the organization of corporations such as California Physicians' Service. By this enactment, the state's social policy in regard to the corporate practice of medicine, to the limited extent specified, has been determined and the courts are bound thereby. (See: *People v. Pacific Health Corp.*, *supra*, p. 161; *Pacific Employers Ins. Co. v. Carpenter*, *supra*, p. 602; 52 Harv. L. Rev. 809-817; 25 Cal. L. Rev. 91-98; 53 Yale L. J. 162-182.) It is stipulated that the Service has complied with the provisions of this statute and holds a certificate in the form authorized by its provisions.

The statutory provisions authorizing the Service's operations do not violate Art. IV, sec. 25, subd. 19, of the California Constitution which prohibits "granting to any corporation, association, or individual any special or exclusive right, privilege, or immunity." As stated in *Livingston v. Robinson*, 10 Cal. 2d 730, 740: "The question of classification is generally one for the legislative power, to be determined by it in the light of its knowledge of all the circumstances and requirements, and its discretion will not be overthrown unless it is palpably arbitrary. (*Wores v. Imperial Irr. Dist.*, 193 Cal. 609.) It will be presumed that the legislature made inquiry to determine whether or not there were evils to be remedied and that the classification made was based upon the result of the

inquiry." And in *People v. Western Fruit Growers*, 22 Cal. 2d 494, 507, it was said: "When a legislative classification is questioned, if any state of facts reasonably can be conceived that would sustain it, there is a presumption of existence of that state of facts, and the burden of showing arbitrary action rests upon the one who assails the classification." (See also: *Gillum v. Johnson*, 7 Cal. 2d 744, 759; *State Bar v. Superior Court*, 207 Cal. 323, 332; *People v. Keith Ry. Equip. Co.*, 70 A.C.A. 445, 461.) The legislature may classify organizations rendering medical services under the same general principles as those which allow it to license for numerous occupations and professions and public policy certainly permits restriction of the right to assume the cost of such services to such organizations as meet reasonable and definite standards. The interest of the state in the health of its citizens (see: *Butterworth v. Boyd*, *supra*) fully justifies the legislative classification. The decision relied upon by the attorney general, *Van Camp Sea Food Co., Inc. v. Newbert*, 76 Cal. App. 445, to support his conclusion is in accord with these general principles but is factually distinguishable.

Considering the question as to the supervision which the state has imposed upon corporations such as the Service, the legislature has defined insurance as "a contract whereby one undertakes to indemnify another against loss, damage, or liability arising from a contingent or unknown event." (Insurance Code, sec. 22; Civil Code, sec. 2527.) Disability insurance "includes insurance appertaining to injury, disablement or death resulting to the insured from accidents, and appertaining to disablements resulting to the insured from sickness." (Insurance Code, sec. 106.) Under Chapter 4 (sec. 10272) of the Insurance Code, which deals with standard provisions in disability policies, "indemnity" is said to mean "benefits promised"; while in the Civil Code, sec. 2772, it is defined as "a contract by which one engages to save another from a legal consequence of the conduct of one of the parties, or of some other person." Otherwise stated, "insurance generally may be defined as an agreement by which one person for a consideration promises to pay money or its equivalent, or to perform some act of value, to another on the destruction, death, loss or injury of someone or something by specified perils." (29 Am. Jur., p. 47.)

These definitions clearly state the basic concepts or elements which are a necessary prerequisite of a contract of insurance. "Whether the contract is one of insurance or of indemnity," said one court, "there must be a risk of loss to which one party may be subjected by contingent or future events and an assumption of it by legally binding arrangement by another. Even the most loosely stated conceptions of insurance and indemnity require these elements. Hazard is essential and equally so a shifting of its incidence. If there is not risk, or there being one it is not shifted to another or others, there can be neither insurance nor indemnity. Insurance also, by the better view, involves distribution of the risk, but distribution without assumption hardly can be held to be insurance." (*Jordan v. Group Health Ass'n.*, 107 Fed. 2d 239, 245; see also: *Fageol T. & C. Co. v. Pacific Indemnity Co.*, 18 Cal. 2d 731; *Gregg v. Comm'r. of Corp. & Tax.* (Mass.), 54 N.E. 2d 169; *Comm'r. Banking & Ins. v. Community Health Service* (N.J.) 30 Atl. 2d 44; *Stern v. Rosenthal*, 128 N. Y. Spp. 711; *State v. Universal Service Agency* (Wash.), 151 Pac. 768; 53 Yale L. J. 172; 23 Corn. L. Q. 188, 193; 119 A.L.R. 1241; 100 A.L.R. 1449; 63 A.L.R. 711; *Vance*, Insurance, 2d ed., p. 57.) Although some authorities have held that to constitute insurance the so-called insured must be indemnified by the payment of money (*Jordan v. Group Health*, *supra*, p. 245, note No. 13; *Moresch v. O'Regan* (N. J.), 187 Atl. 619; 5 *Elliot*, Contracts, sec. 4020), or that statutes regulating insurance were intended to apply only to concerns

¹Sec. 593a (Health service corporations: Prerequisites to commencement of business: Supervision.) A nonprofit corporation may be formed under this article for the purpose of defraying or assuming the cost of professional services of licentiates under any chapter of Division 2 of the Business and Professions Code or of rendering any such services but it may not engage directly or indirectly in the performance of the corporate purposes or objects unless:

"(1) At least one-fourth of all licentiates of the particular profession become members;

"(2) Membership in the corporation and an opportunity to render professional services upon a uniform basis is available to all licensed members of the particular profession;

"(3) Voting by proxy and cumulative voting are prohibited; and

"(4) A certificate has been issued to the corporation by the particular professional board, whose licentiates have become members, finding compliance with the foregoing requirements.

"Any such nonprofit corporation shall be subject to supervision by the particular professional board under which its members are licensed and shall also be subject to the provisions of Section 605c of this code. This section, except as expressly permitted herein, does not authorize the formation of any corporation for the purpose of rendering the professional services regulated by Division 2 of the Business and Professions Code. (Added by Stats. 1941, ch. 623, sec. 1.)"

organized for profit and not to charitable or nonprofit associations (Hall D'Ath v. British Provident Assoc. (1932), 48 Times L. R. 240; State v. Taylor (N. J.), 27 Atl. 797), there are more substantial reasons upon which to base a determination as to the status of the California organization.

The business of the Service lacks one essential element necessary to bring it within the scope of the insurance laws, for clearly it assumes no risk. Under the provisions of the contracts or group agreements, it is a mere agent or distributor of funds. It does not promise the beneficiary members that it will provide medical care; on the contrary, "the services which are offered to . . . beneficiary members of C.P.S. are offered personally to said members by the professional members of C.P.S. . . ." (See: Jordan v. Group Health Assn., *supra*, p. 246; Phez Co. v. Salem Fruit Union (Ore.) 201 Pac. 222.) The professional member is compensated for his services solely from the fund created by the monthly dues to the beneficiary members. Payments from the fund are made to the physician pro-rata in accordance with an established schedule. Under that plan, the amount of compensation of the professional members is variable and may be high or low, depending upon the incidence of sickness and the number of beneficiary members paying dues. Stated in terms of insurance, all risk is assumed by the physicians, not by the corporation, hence the only effect of requiring compliance with regulatory statutes would be to compel the acquisition of reserves contrary to the established method of operation. (See: Jordan v. Group Health Assn., *supra*, p. 251.)

This distinction has been recognized and applied by other courts which have considered the same question. In Jordan v. Group Health Assn., *supra*, the organization which distributed funds for medical care sought a declaration of its statute under the laws of the District of Columbia which define insurance in substantially the same terms as the California statutes. The corporate purpose of the association and its method of doing business was similar to that of California Physicians' Service. The court held that the corporation had assumed no risk. This conclusion applies more exactly to the California organization because of the total lack of a promise by the corporation to the beneficiary members to render any medical care. Except for the limited hospitalization obtainable by rural members in connection with the Farm Security Administration contract, the Service does not even promise to "use its best efforts to procure the needed services" as the District of Columbia corporation agreed to do, and does not obligate itself to pay the physicians a certain sum per month. The California physicians look solely to the monthly dues of the beneficiary members for compensation.

The case of State v. Universal Service Agency (Wash.), 151 Pac. 768, relied upon in the Jordan case, *supra*, p. 249, was an action by the insurance commissioner to forfeit the corporate franchise of the organization upon the ground that it was "doing an insurance business without complying with the statutes regulating the doing of such business." The applicable definition of insurance was similar to, if not identical with, that of this state, and the method of doing business was the same as that of the California Physicians' Service, including the type of contract used. And again the want of assumption of any hazard or risk was the basis for holding that the corporation was not engaged in the insurance business.

In the case of Commissioner of Banking and Insurance v. Community Health Service, Inc., 129 N.J.L. 427, 30 Atl. 2d 44, the insurance commissioner sued the defendant corporation to recover a statutory penalty for conducting an unlicensed insurance business. The corpora-

tion had made contracts with licensed physicians under which they agreed to render professional services for a certain stipulated compensation to those members of the general public who paid the corporation a specified sum each month. The physicians' services were engaged by the corporation for a period of one year, and from year to year thereafter, for a fixed consideration which varied with the number of contract holders but not with the amount of service rendered by the physician to any or all of the contract holders. The court, relying upon State v. Universal Service Agency, *supra*, and Stern v. Rosenthal, 128 N.Y.S. 711, held that the corporation was not engaged in the business of insurance because, as between the corporation and the physician, nor between the physician and the subscriber, was the compensation or any other element of the arrangement between them affected by any contingency, hazard or risk which the corporation assumed and insured against. (See also: Vrendenburgh v. Physicians Defense Co., 126 Ill. App. 509; State v. Laylin, 73 Ohio St. 90; 53 Yale L. J. 172.)

In both the Jordan case, *supra*, and in State v. Universal Service Agency, *supra*, as is true in the present case, reliance was placed upon Physicians' Defense Co. v. O'Brien, 100 Minn. 490, Physicians' Defense Co. v. Cooper, 199 Fed. 2d 576, and State v. Globe Casket Co., 82 Wash. 124. The Physicians' Defense cases involved contracts to supply legal service to physicians in malpractice suits; the latter one concerned an agreement for burial expense. But in each of those cases there was a contract providing indemnity against a hazard which might cause loss to the corporation and, for that reason, the decisions are not herein point.

There is another and more compelling reason for holding that the Service is not engaged in the insurance business. Absence or presence of assumption of risk or peril is not the sole test to be applied in determining its status. The question, more broadly, is whether, looking at the plan of operation as a whole, "service" rather than "indemnity" is its principal object and purpose. (Jordan v. Group Health Assn., *supra*, pp. 247 et seq.; see: Vrendenburgh v. Physicians' Defense Co., *supra*, p. 513; State v. Laylin, *supra*, p. 98; Commonwealth v. Provident Bicycle Ass'n., 178 Pa. 636, 642; Sisters of Third Order of St. Francis v. Gillaume, 222 Ill. App. 543; 3 Univ. of Pittsburgh L. Rev. 250; 52 Harv. L. R. 814, 815; 23 Corn. L.Q. 188; 29 Mich. L. Rev. 378; Vance, Insurance, p. 61.) Certainly the objects and purposes of the corporation organized and maintained by the California physicians have a wide scope in the field of social service. Probably there is no more impelling need than that of adequate medical care on a voluntary low-cost basis for persons of small income. The medical profession unitedly is endeavoring to meet that need. Unquestionably this is "service" of a high order and not "indemnity."

The fact that the Rural Health Service Agreement provides for limited hospitalization does not make the business of the Service that of insurance. So far as the record shows, a participating hospital must look only to the pooled fund of the Service for payment for facilities furnished to a beneficiary member. Also, the additional features of hospitalization and reimbursement for drugs are not distinguishable from other medical care obtainable on the group basis, and they are merely incidental to the plan or scheme as a whole. (See: Jordan v. Group Health Assn., *supra*, p. 244 note No. 10.)

Furthermore, the legislature by the enactment of section 593a of the Civil Code, with its express provision for limited regulation of nonprofit organization of a professional character by the attorney general and the particular professional board, necessarily intended that such organization should be exempt from regulation by the insurance commissioner. (See: 52 Harv. L. Rev. 816; 53

Yale L. J. 171 et seq.) One of the reasons behind the declaration of the earlier cases that it was against public policy for a corporation to engage in the practice of medicine was because the control of its activities was placed in the hands of laymen. (See: *Pacific Employers Ins. Co. v. Carpenter*, *supra*; *Painless Parker v. Board of Dental Exam.*, 216 Cal. 285, 296; 52 Harv. L. R. 811; 53 Yale L. J. 170.) To allow the insurance commissioner to impose the extensive regulations provided for in the Insurance Code upon the activities of the Service would result in the same evil. (See: Yale L. J. 171.) Since section 593a of the Civil Code is applicable to the organization whose status is here under attack, it must be presumed that the legislature weighed this evil against possible exploitation of the public and concluded that the limited regulation provided by the new statute was sufficient. Also, it may be noted, section 433.6 of the Political Code dealing with payroll deductions for state employees who join any group medical plan, makes a clear distinction between regular insurance companies and "non-profit membership corporations organized under the laws of this State, for the purpose of defraying the cost of medical services. . . ." (See also: Stats. 1939, ch. 250 p. 1505; Stats. 1940, First Extra Session, ch. 45, sec. 6.7.)

This conclusion becomes more apparent when the purpose and nature of many of the legislative requirements are considered, particularly those relating to the maintenance of reserves and to the regulation of investments and financial operations. The extensive insurance regulations primarily are designed to protect the insured or the public, from the insurer. (52 Harv. L. Rev. 815.) Such regulations become important only if the insurer has assumed definite obligations; conversely, it is evident that they are not intended to apply where no risk is assumed and no default can exist. Furthermore, by the very nature of its operations, the Service could not accumulate vast reserves. The flow of funds from patient to physician primarily is on a monthly basis of pay-as-you-go and to require reserves would be a useless and uneconomic waste. (*Jordan v. Group Health Ass'n.*, *supra*, p. 251; see: 53 Yale L. J. 171.)

For these reasons the respondent is not engaged in the business of insurance within the meaning of the regulatory statutes but is subject to the limited supervision provided by sec. 593a of the Civil Code. The judgment of the trial court in this regard is not too broad, for every decision is limited to the evidence upon which it is based

EDMONDS, J.

WE CONCUR:

Shenk, J.

Ward, J. Pro. Tem.

Carter, J.

Peters, J. Pro. Tem.

I CONCUR IN THE JUDGMENT: Schauer, J.

CONCURRING OPINION

Gibson, C. J.

CONCURRING OPINION

I concur in the judgment solely on the ground that the Legislature, by the enactment of section 593a of the Civil Code, exempted organizations coming within its scope from regulation by the Insurance Commissioner. By providing for supervision by a professional board and by the attorney general (Civ. Code, secs. 593a, 605c), the Legislature has evidenced an intention to free such organizations from other regulation and from the necessity of complying with the various requirements, such as the maintenance of reserves, which are imposed on regular insurance companies. The need for regulation or supervision, the amount thereof and the persons, bodies or officers who should supervise or regulate are all matters which are confided to the Legislature, and it was within the legislative discretion to provide that a limited regulation of such nonprofit organizations was sufficient.

I cannot, however, concur in that portion of the opinion declaring that the plaintiff is exempted from regulation by the Insurance Commissioner because it is not engaged in the business of transacting insurance, but is merely agreeing to render service. The true test is not the character of the consideration agreed to be furnished, but whether or not the contract is aleatory in nature. A contract still partakes of the nature of insurance, whether the consideration agreed to be furnished is money property or services, if the agreement is aleatory and the duty to furnish such consideration is dependent upon chance or the happening of some fortuitous event. (See Rest., Contracts, sec. 291.) In the present case the agreement is to make payments to member doctors for medical services to the beneficial members and the duty to make such payments is obviously dependent upon chance or the happening of a fortuitous event, since the necessity for the services, and also for the agreed payment, is dependent upon the members' sickness or accidental injury.

GIBSON, C. J.

Clinical Laboratory Technicians Must Be Licensed

Because of repeated indications that "a number of physicians throughout California are not conversant with provisions of the Clinical Laboratory Act" relative to employment of clinical laboratory technicians, W. L. Halverson, M.D., Director of Public Health, has asked CALIFORNIA MEDICINE to call attention to some of the salients.

"This law," Dr. Halverson says in a letter to the editor, "requires that any technicians who engage in clinical laboratory work shall be in possession of a license issued by the California State Department of Public Health. Violation of the Act, either on the part of the technician or of the employer, is a misdemeanor."

The letter continues: "While physicians may legally operate clinical laboratories under their license as physician and surgeon, this does not exempt them from the provision of the law requiring the employment of licensed technicians to actually do the work in the laboratory. It

has been our observation that many physicians are not cognizant of this requirement. While the law does permit one apprentice to work in a laboratory, this is with the proviso that such apprentice be under the direct supervision of licensed personnel.

"It should also be noted that any physician who assumes the responsibility for directorship of a laboratory must actually spend sufficient time in the laboratory to supervise adequately the work of the personnel. Under the provisions of the law, supervision cannot be delegated to a technician on the staff who holds only a clinical laboratory technician's license.

"Detailed information concerning the provisions of the law may be secured by physicians from the Division of Laboratories, 3073 Life Sciences Building, Berkeley 4. Copies of the law and the regulations adopted under the law will be sent upon request."

Letters to the Editor . . .

CONTRADICTIONARY TERMINOLOGY IN OBSTETRICS

The growth in knowledge of developmental anatomy during this century has outdistanced the development of a rational terminology. Consequently, much of the terminology of developmental anatomy and obstetrics is confusing or contradictory. While an adequate outline of the semantic deficiencies of morphogenesis cannot be attempted here, let us look at some of the more flagrant examples of faulty terminology for which revision is not difficult.

The terms *ovum*, *embryo* and *foetus* are used more or less indiscriminately to designate the product of conception. This use probably stems from His' division of human gestation into three periods: the ovular, the first two weeks; the embryonal, the third to fifth week; and the fetal, the sixth week to term. Later authors have reserved the word *foetus* for the child *in utero* after the third month of gestation. There exists no morphologic nor physiologic basis for these and similar arbitrary divisions of the span of gestation. Here we find the same term used to describe the unfertilized female gamete and the two-week-old product of conception. The advantages of a word describing the total product of conception from the two-cell-stage to term are apparent; and for this purpose the convenient term of *conceptus* has much to recommend it. The word *ovum* would then be limited to the unfertilized female gamete and the word *zygote* would then be reserved for a fertilized or parthenogenetically activated gamete in the process of the first cleavage stage.

Foetus has also been defined as "the medical synonym for embryo" (J. Needham, "Biochemistry and Morphogenesis," p. 684) and this definition has met with some acceptance. Indeed, there exist no criteria by which the two words may be distinguished. But the *conceptus* comprises more than the embryo or foetus. In 1889 Hubrecht discovered the trophoblast and this introduced an additional complexity into the accepted meaning of the word *embryo*. Our terminological inadequacy is now such that it is not uncommon to find an author defining *trophoblast* as "the non-embryonic part of the mammalian blastocyst . . . which later develops into the foetal portion of the placenta" and then defining *foetus* as "the medical synonym for embryo" (ibid, pp. 684, 688). It would contribute much to the clarification of the subject of morphogenesis if the word *embryo* were limited to those anlagen of the *conceptus* that enter directly into the formation of the post-natal individual.

Separating the definitive *embryo* from the *conceptus*, we are left with such *extra-embryonic* structures as the amnion, allantois, yolk-sac and umbilical cord. Although these structures are closely associated in development with the definitive embryo, they are properly called *extra-embryonic* since they comprise no part of the post-natal individual. The remaining trophoblast, composed of cellular and syncytial elements, is correctly described as the *non-embryonic* portion of the *conceptus*, since the cleavage of the zygote results in the precocious segregation of the trophoblast cells from the remaining cells of the early *conceptus*; and from this time on the two cell types go their independent way and the one cannot form the

other nor be formed from the other. The dichotomy between trophoblast and the non-trophoblastic elements of the *conceptus* was dramatically demonstrated by Maximov when he cultured entire rabbit conceptuses *in vitro* and found that the definitive embryo and extra-embryonic membranes were, after a fortnight, completely destroyed by the infiltration and erosion of the trophoblast which consumed all non-trophoblastic elements in the culture (A. Maximov, *Carnegie Contrib. Embryol.*, 16:47, 1924). In terms of the older terminology one would perhaps describe this case as one in which the "embryo" consumed itself.

The misuse of the word *embryo* has been responsible for such errors, perpetrated in reputable textbooks, as describing the trophoblast as ectodermal when it is, in fact, autonomous in origin and fate of the three primary germ layers of the remainder of the *conceptus*. In the case of tubal pregnancies in which the trophoblast destroys the definitive embryo with the formation of a so-called "blood mole" the value of an adequate terminology for descriptive purposes is clear. (The latter phenomenon might be considered the *in vivo* counterpart of what Maximov described as occurring *in vitro*). The same generalizations apply to the overgrowth of trophoblast in hydatid mole and chorionepithelioma—which occur in the absence of the definitive embryo. And surely the case of identical twins or triplets, etc., sharing a single trophoblastic blastocyst (or chorion) strikingly demonstrates the need for the use of the proper terms to distinguish such a monozygotic *conceptus* of a fixed genetic constitution from the definitive embryos which in part comprise that *conceptus*.

Indeed, the use of the word *embryology* to describe the total phenomenon of gestation is not altogether adequate, and the growing use of such alternative terms as *developmental anatomy* or *morphogenesis* is a hopeful sign.

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IRON SALTS VS. PLUMBISM

The influence of iron salts on the development of lead poisoning has been studied by Heppel¹ and his associates of the National Institute of Health, Bethesda, Maryland.

Albino rats were fed experimental diets from the time of weaning. The animals were weighed at four to seven day intervals, and tail blood used for smears and micro-determinations. In a typical experiment, the average weight of ten young rats reared on a non-toxic basal diet was 43.2 g. at the time of weaning. The weight increased to an average of 239.4 g. by the end of 65 days. The average hemoglobin content increased to 16.1 g. per 100 cc. of blood and the average hematocrit reading to 49 per cent in the same period of time. Terminal blood smears showed an average of 3.8 polychromatic red cells per 1,000 r.b.c. In a parallel test of ten weanling rats fed a leaded diet (0.09 g. lead per 100 g. of basal diet) the

average weight increased to only 143.2 g., the hemoglobin fell to 10.5 g. per 100 cc., and the hematocrit reading to 39 per cent by the end of 65 days. Terminal blood smears showed a 12-fold increase in polychromatic red cells (49 per 1000 r.b.c.) In a third group of weanling rats, in which 1.13 g. ferric citrate per 100 g. was added to the lead diet, the average terminal weight was 203.1 g.; hemoglobin 14.7, hematocrit reading, 51 per cent and polychromatic count only slightly above normal (8.2 per 1000 r.b.c.).

Given in this concentration, ferric citrate thus almost completely prevented the toxic effects of the lead diet. Since control tests with sodium citrate did not inhibit toxicity, the conclusion was drawn that the prophylactic effect was not due to the citrate radicle.

The mechanism of his antitoxic action of iron salts has not yet been determined. A possible explanation would be the assumption that iron citrate interferes with the gastrointestinal absorption of lead. Such a possibility was suggested 15 years ago by Miyasaki.² Confirming this theory, analyses have shown a much lower lead content of tissues of rats whose lead diet contained supplements of iron citrate. Studies of the absorption of radioactive lead in the presence and absence of iron compounds are now in progress.

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ANTI-ALLERGIC "BLOCKADE"

In the course of studies of experimental drug allergy, Chase¹ of the Rockefeller Institute noted that sensitization was at times unsuccessful in guinea pigs which previously had ingested or had otherwise been treated with the same drug. Experiments were therefore undertaken to establish at will such an anti-allergic refractory state.

For his first experiments 2:4 dinitrochlorobenzene was chosen as the sensitizing agent. This is a well known active dermal allergenic agent for man. A 1 per cent solution of this drug in olive oil was fed to guinea pigs in 0.3 cc. doses. The doses were given in such a way as

to avoid contact with the muzzle of the animal. The feedings were made daily for six days, followed by an eight-day rest period, two to three such courses being given. Control feedings were made with the vehicle alone (olive oil).

After a rest period of two weeks the animals were subjected to active sensitizing. This consisted of six or more intracutaneous injections of the drug over a period of several weeks. Two weeks after the final sensitizing dose, a test of acquired dermal sensitization was made by painting the skin with a dilution of the incitant in olive oil. Of 77 control animals, none escaped sensitization, 90 per cent of them showing maximal or near-maximal skin reactions. Of 93 animals given a prior feeding with the drug, 67 per cent escaped all but a trace of sensitization. Only 3 per cent of them gave maximal skin reactions. There was thus a well-nigh complete inhibition of subsequent dermal sensitization as a result of previous feeding with the allergenic drug.

To test the duration of this refractory state, groups of animals were fed the same drug and at varying intervals after the final feeding were given the routine dermal sensitizing course. The refractory state was still apparent even when the interval between the final feeding and attempted sensitization was as long as 27 weeks. Longer intervals were not tested.

The refractory state is apparently specific. Animals fed 2:4 dinitrochlorobenzene are fully susceptible to subsequent dermal sensitization with *o*-chlorobenzoyl chloride. Specific feeding, however, is ineffective therapeutically. Courses of feeding given to animals previously sensitized to 2:4 dinitrochlorobenzene caused no appreciable reduction in the degree of dermal hypersensitivity. This is contrary to the findings of Park² and Stevens³ who have reported a partial desensitization of sensitive human beings by ingestion of specific allergens.

No theory is as yet suggested to account for Chase's pe-allergic "blockade." Serum titers have not yet been reported. It is evident, however, that prophylactic anti-allergic "blockade" is of suggestive clinical interest.

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Stanford University.

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BOOK REVIEWS

DISEASES OF THE ADRENALS. By Louis J. Soffer, M.D., Adjunct Attending Physician, The Mount Sinai Hospital, New York City. Cloth. Pp. 304, illustrated with 42 engravings and 2 colored plates. Philadelphia: Lea & Febiger, 1946.

As is so frequently noted in recent days, the science of endocrinology is growing up. No longer are monographs on this subject composed largely of bizarre photographs and equally bizarre clinical guesswork. Modern endocrinology speaks in terms of fundamental physiology and deals with an ever increasing number of specific chemical entities of known structure and function.

This little book by Dr. Soffer on *Diseases of the Adrenals* is a good example of the modern approach. While in clinical practice specific adrenal disease is relatively rare, it behooves every practitioner, internist and surgeon to have a working knowledge of adrenal function, especially those functions relating to the electrolytes, specifically sodium and potassium; to carbohydrate and protein metabolism; and to sexual development and function.

The chapters on physiology are clear and concise. Existing lacks in knowledge are frankly stated and there is a refreshing lack of speculative dogmatism.

The clinical discussions of Addison's disease, the adreno-genital syndrome, and the various adrenal tumors are excellent and not too long. They are well illustrated with selected case histories. The latter are condensed to their essentials. The clinical manifestations are well correlated with known physiology, and the sections on specific therapy are definite and inclusive.

The style is simple and easy to read.

The bibliography is most comprehensive, the section on physiology alone citing 219 references.

The reviewer enjoyed this book and recommends it for general as well as more specific reading.

DISEASES OF THE RETINA. By Herman Elwyn, M.D., Senior Assistant Surgeon, New York Eye and Ear Infirmary. Cloth. Price, \$10.00. Pp. 587 with 170 illustrations, 19 in color. Philadelphia: The Blakiston Company, 1946.

The author has divided the subject matter into eight parts and forty-two chapters. The first two parts include 17 chapters dealing with diseases of the retina resulting from disturbances in circulation and from vascular malformations. This is covered in a way which makes interesting reading, and it is well illustrated with fundus photographs and reproductions of many pathologic sections. An attempt is made in these chapters to correlate the fundus picture with the underlying systemic vascular disease or anomaly so that it makes a handy reference volume for both the ophthalmologist and internist. Arteriosclerosis, both general and local, in the eye-grounds, essential hypertension and arteriospastic retinitis in kidney diseases, is taken up in considerable detail. The paragraphs on pathologic anatomy and pathogenesis in each chapter are short and to the point.

In the chapter on diabetic retinitis, an interesting comparison is drawn between diabetes, essential hypertension and chronic simple glaucoma. It appears to be the author's belief that in all these diseases the mechanisms for control of normal values of blood sugar, blood pressure and intra-ocular pressure, respectively, are inherently deficient. He attributes this inherent instability to an in-

herited defect present in the germ plasm and says that it appears at a definite early period in life. He states that in the case of diabetes, the cause of the instability is not to be found in the effector organs such as the liver, in the islands of Langerhans or in the peripheral vegetative nervous system. He stresses the central nervous system of brain as the regulating mechanism.

The remaining chapters include many of the rarer diseases of the retina of the degenerative type, such as retinitis pigmentosa, heredo-degeneration of the macula, amaurotic family idiocy, etc.

Inflammatory disease of the retina discussed include tuberculosis and syphilis. There is a short chapter each on retinal changes in septicemia and in subacute bacterial endocarditis. Only one case was reported to prove that tuberculosis of the retina could exist in pure form.

In the section under tumors of the retina, glioma or retinoblastoma is discussed extensively. The technique of radiation therapy as outlined by Martin and Reese is given under the paragraph for treatment. The rarity of other primary tumors of the retina is emphasized. He states that there are only three reports in the literature, one of a perithelioma of the retinal vessels, one of endothelioma of the nerve head, and one of sarcoma of the retina.

Approximately sixty pages are given to a discussion of the diseases leading to retinal detachment and to the etiology clinical picture, pathologic anatomy and treatment of the condition. For the benefit of the few medical men and possibly the rare ophthalmologist inclined to write off one eye with retinal detachment without attempting surgery, figures are given on bilaterality of the condition. The figure approaches 18 per cent in one large series.

ANESTHESIA IN GENERAL PRACTICE. By S. C. Cullen, M.D., Head of Division of Anesthesiology, Department of Surgery, State University of Iowa's Hospitals; Associate Professor of Surgery (Anesthesiology), State University of Iowa's College of Medicine. The Year Book Publishers, Inc., Chicago. Price, \$3.50.

The chapters of this book on Preanesthetic Medication; Airway Inhalation Anesthesia Agents and Techniques; Signs of Anesthesia; Choice of Anesthetic Agent and Technique; Recognition and Treatment of Shock; Oxygen Therapy; Pre and Postoperative Care of the Patient and Explosion Hazards are presented in a clear, concise manner. They should be of value to beginners in anesthesia and to those doing anesthesia on a part-time basis.

The chapters on Spinal Analgesia and Regional are not on a par with the remainder of the book and contain statements such as: "The selection of a drug for spinal analgesia can be made solely on a time basis. Toxic properties of these drugs need not be considered because toxic reactions do not occur following the introduction of these drugs intrathecally." Such statements interpreted literally by a novice could easily lead to a fatality from administration of too large a dose of a toxic anesthetic agent.

The description and illustrations of the correct treatment of reactions to local anesthetic agents are well done.

On the whole the book is well written and contains much of value.

HUMAN EMBRYOLOGY. By Bradley M. Patten, Professor of Anatomy in the University of Michigan Medical School. Cloth. Price, \$7.00. Pp. 776 with 1366 drawings and photographs grouped as 446 illustrations; 53 in color. Philadelphia: The Blakiston Company, 1946.

This book perhaps will not be considered a classic work in the field of human embryology because of the necessary limitations imposed upon it as a textbook primarily for the medical student, but as such a text it cannot be excelled.

The fluent literary style, the adequate illustrations, the good printing and excellent paper all go together to make a fine book. The beginning medical student will find it easy to study; the practitioner will find it difficult to put down once he opens its pages. There are many clinically important subjects discussed, and to the doctor who is a student, as well as a surgeon, the sections of the book dedicated to the abnormalities of development of the various systems will be most valuable in the interpretation of many pathological conditions.

The bibliography is excellent and contains numerous references to work of clinical importance. This enhances further the value to the clinician who might wish more detailed information on a special subject.

THE CARE OF THE AGED (GERIATRICS). By Malford W. Thewlis. Fifth edition. (St. Louis. The C. V. Mosby Co., 1946.) 500 pages. Price, \$8.00.

Though Thewlis emphasizes the present need for increased, active interest in the growing population of patients past 60, his book is not merely an expression of the current enthusiasm toward geriatrics as a medical specialty. The first edition of the text was published in 1919. In his preface to the third edition, the author stated: "There is a wider recognition today that the ills of the aged are a special problem: first, because many of them are peculiar to the aged, and second, because the presence even of those which also occur in younger people raise special therapeutic problems in senescence." Having suggested by simple prefatory statement that the care of the elderly may become a specialty, he has done with propaganda and proselytizing and settles to his text.

The volume is written in eight parts and thirty-three chapters. The first 121 pages are essentially concerned with the general problems of uneventfully growing old. Here is clearly, sensibly, and forcefully expressed the art of treatment of the aged—the philosophy of "geratology" and its relation to the aged group and aged individual. Separate attention is given to the neglect of the elderly, stress and longevity, medico-legal relations most apt to involve the group and its physicians, the general and differential use of therapeutic agents, the details of nursing care. Anatomic, physiologic, and pathologic alterations of senescence are adequately described without the clutter of minutiae. A separate chapter stresses the need for vigilance toward pre-symptomatic disease in routine examinations. In the chapter devoted to hobbies, the author not only stresses their importance but provides several pages of practical suggestions for such activities.

Thewlis writes: "Geriatrics is based upon three fundamental principles: (1) that senescence is a physiologic entity like childhood and not a pathologic state of maturity; (2) that disease in senescence in a normally degenerating organ or tissue is not a disease such as is found in maturity, but is complicated by degeneration; (3) that the object of treatment in senescence should be to restore the diseased organ or tissue to the state normal to senescence and not a restoration to the condition normal in maturity." In the main body of the text which is devoted to Disease of Metabolism and Endocrine Disorders, Infectious Diseases and Focal Infection, and

Systemic Pathologic Conditions, these principles are repeatedly stressed. In this sense these chapters remain throughout devoted to the consideration of aged patients.

In general it is obviously better for the reader to consult the literature and texts devoted to the consideration of the particular disease or system involved by disease in studying an illness concerning a patient of any age group. Statements throughout the text—as some in the chapter on the Cardiovascular System, to be particular—are misleading if one relies solely upon Thewlis' discussions. This is a valid criticism of all geriatrics texts: what they have to tell us that is peculiar to the aged does not supplant that which is peculiar to the disease. However, it is in this special regard that Thewlis' book surpasses its chief rival in the field—Stieglitz's "Geriatric Medicine. . . ." Thewlis seems in general aware that his material does not supplant but only supplements. Furthermore, though other authors have contributed to "The Care of the Aged," their chapters are brief, and the effect is of single authorship. This, or careful editing, has prevented the striking unevenness of merit and bothersome repetition that depreciate Stieglitz's book.

"The Care of the Aged" is practical. It contains all presently available material that is pertinent to its thesis. It is clear, readable and well organized. The index is detailed, extensive, and accurate. Discussions include the scientific finesse of anesthesia, the mathematical angle in surgical risk, the proper size of sox and weight of underwear, the normalities as well as the abnormalities of geriatric sex life, when to take a bath, and how best to clean false teeth.

Throughout there is suggested the thought expressed in a chapter summary: "Let the ultimate comfort of the patient be the main consideration. Be gentle, be conservative, be careful and be kind."

WOMEN IN INDUSTRY. By Anna M. Baetjer, SC.D., Asst. Professor of Physiological Hygiene, School of Hygiene and Public Health, The Johns Hopkins University. W. B. Saunders Company, Philadelphia and London—1946. Price, \$4.00.

A cursory inspection of this book would lend belief that it is of value only to the industrial physician, personnel director, or job placement officer. Yet further study reveals its importance to the profession at large.

It has been estimated that 16 million women will be employed in industry by 1950, barring serious economic disorders. The problems entailed cannot be met by industrial medicine since a majority of these women will be working in small plants where there is no medical supervision. The responsibility, therefore, must be met by the general practitioner and special aspects of it by the gynecologist and obstetrician. Too long has the profession been ignorant of what women can or cannot do; doctors have permitted women to do certain tasks when they should have been refused, or have denied them privilege when they should have been allowed. These errors have been based upon legendary assumptions. Dr. Baetjer dispenses these false notions by statistical evidence.

The book deals with the anatomy of the female as to height, weight, reach, fatigability, susceptibility to certain types of strain (or non-susceptibility), types of work to which women are peculiarly suited, value of rest, especially as to change of routine. It considers the incidence of absenteeism, accidental injuries, occupational diseases among women, and such special problems as pregnancy, lactation, menses, menopause, fertility, and the like. An appendix contains a summary of the state labor laws for women of the various states.

"Women in Industry" is not a clinical study, but Dr. Baetjer has contributed a valuable group of statistics

which should form a basis for sane handling of women who choose to work.

PULMONARY TUBERCULOSIS IN THE ADULT, ITS FUNDAMENTAL ASPECTS. By Max Pinner, M.D. Chas. C. Thomas, publisher, Springfield, Ill. 1945. XIII and 579 pages. Fifty-nine figures and 4 graphs. \$7.50.

This clear, coherent and comprehensive exposition of the fundamental mechanisms underlying clinical tuberculosis should be a valuable guide, not only to the general practitioner and the medical student but even to those who have long specialized in this tangled field.

The slow multiplication, high resistance and exacting nutritive requirements of the tubercle bacillus underlie its clinical behavior and suggest means of controlling it. Pathological, radiological and clinical findings contribute to the understanding of the histogenesis of tuberculous lesions, as exemplified by the classification of cavities and their prognostic and therapeutic implications.

Productive tissue reactions, strict localization of lesions, and acute inflammatory response at the site of implantation characterize both native and acquired resistance to tuberculosis. Humoral antibodies are irrelevant in this disease. Skin and general tissue hypersensitivity must be distinguished, and the protective value of vaccination with BCG balanced against its practical disadvantages.

The various lesions which develop following reinfection differ in their morphology, mode of origin and later course. Nutritional, endocrine, constitutional, meteorological and other factors may influence their evolution.

The practical utility of the National Tuberculosis Association Classification of Pulmonary Tuberculosis is conceded but Ranke's stimulating hypothesis has more imaginative appeal. Pulmonary phthisis, with localization in one organ system, acute episodes of exudation and tissue destruction with slow chronic reparative processes or the dangerously defensive phenomenon of excavation reflect the immunobiological constellation of the host and the tubercle bacillus and the special structure and function of the lung. Exudation, caseation, fibrosis and cavitation are interpreted from this point of view.

Case finding with the demonstration of tuberculous infection by skin tests, of pulmonary foci by the x-ray, and of the specific nature of the lesion by bacteriological findings, and the clinical roentgenological and laboratory evaluation of the activity of the process illustrate the value of the combined approach. The reliance of negative sputum findings in tuberculosis, the dismissal of quantitative bacteriological findings, the skeptical rejection of all hematologic and serological aids in prognosis and the advocacy of clinical experimentation without preliminary animal studies may be questioned by other workers.

Factors involved in the healing of tuberculous lesions include local rest, elastic relaxation, bronchial occlusion, decreased tidal air, blood and lymphatic flow, and oxygen availability, and increased fibrosis. The treatment of tuberculosis by simple rest and medical measures is emphasized.

The discussion of collapse therapy is based on the assumption that healing by rest alone, if it can be achieved, is preferable to healing under collapse. Little value is attributed to phrenic interruption, pneumoperitoneum and other minor collapse measures.

An epidemic curve in tuberculosis, with a tendency of the disease to diminish in countries in which it has been established, is accepted despite glaring exceptions and alternative explanations.

The annotated references which occupy more than a quarter of the book not only cite the substance of each contribution, but often include a critical evaluation of its significance and suggestions of implications or other pertinent data. Photographs of gross and histological preparations and single or serial roentgenograms graphically illustrate many of the points made in the text.

Although some may differ with the author on individual conclusions, it must be admitted that he is unsurpassed in his command of the literature in this field and is admirably fitted for its evaluation. It is gratifying in these hurried and mechanized days to find such a product of deliberate contemplation and analysis of fundamental concepts as applied to what is still the most important single disease afflicting man.

SUBSTANCES PLACED ON BODY SURFACE NEED MORE STUDY, JOURNAL SAYS

Referring to cases of poisoning associated with the use of thioglycolic acid in the so-called cold wave process for permanent waving of the hair, the June 29 issue of *The Journal of the American Medical Association* says editorially that "as much careful evidence needs to be accumulated regarding the safety of substances placed on the surface of the body as those taken into its interior before these processes are released for use to the general public."

The statement was made in connection with an article in which Carey P. McCord, M.D., of Detroit, called attention to certain facts which he believed were overlooked by Lawrence H. Cotter, M.D., of New York, in his discussion of the cold wave process in *The Journal* of June 15. Dr. McCord believes that damage to the liver by the use of cold wave chemicals has not yet been defi-

nately shown in any instance and that allergic responses are infrequent when materials used are properly prepared.

"Notwithstanding these statements," the latest issue of *The Journal* says, "the fact remains that some 50 different commercial agencies are engaged in the manufacture of materials used in cold wave processes, that there exist no definite standards as to what is safe or harmful, that experimentation before launching such products is for the most part inadequate and incomplete and that it is time for public recognition of the fact that as much careful evidence needs to be accumulated regarding the safety of substances placed on the surface of the body as those taken into its interior before these preparations are released for use to the general public."



MEDICAL JURISPRUDENCE

MALPRACTICE: SUFFICIENCY OF EVIDENCE: DEGREE OF SKILL REQUIRED OF A PHYSICIAN

HARTLEY F. PEART, ESQ.

San Francisco

A recent case decided by the District Court of Appeal of the State of California again goes into a detailed consideration of the medical procedures and surgical techniques which were employed during an operation, in order to determine whether or not the operating surgeons had been negligent. The surgeons were absolved of any liability.

In this case the California Appellate Court was presented with the following situation: The patient, Mr. A, while constructing an addition to his home, was attempting to split lumber which was nailed together. In this process, he was using a carpenter's wrecking bar upon which he was hammering with a hammer, while holding the bar across his thighs. Suddenly, he felt something strike his right eye with a resultant severe burning pain, lasting for approximately one-half hour. He then looked into a mirror and observed a small red spot in the extreme right corner of his eye.

After consulting several hospitals and physicians, Mr. A went to defendant Dr. B's office and was taken to Dr. X's office in the same building and x-ray pictures were taken by the last named doctor. It was determined that an operation was necessary and Mr. A was taken to a hospital where the operation was performed. The operation was described by the defendant, Dr. B, as follows:

"After the eye was anaesthetized, the conjunctiva was picked up approximately over this foreign body and was dissected back over this foreign body, exposing this sclera—that is, that dense solid membrane, the sclera. Then a little opening was made in the wall of the eye with a cataract knife, just a tiny little opening, and then the magnet was put up against this opening and the current turned on. That was done at least a dozen times, and no foreign body came. And then after I saw that the magnet was not going to pull the foreign body, I took a tiny little pair of iris scissors. The incision was just as wide as that little knife. The cataract knife. Then after we could not get the foreign body with the magnet—it seemed to be non-magnetic, wouldn't come to the magnet—I introduced the tip end of a little pair of scissors about four millimeters—into approximately where this foreign body was, getting it close. I did that in preference to putting the tip of the magnet, because the magnet is a great big thing and would have enlarged the wound. I used the scissors, because the scissors are the best type of steel; and by putting the scissors into that little opening, almost in contact with the foreign body,

then putting up the magnet—touching the magnet on that, I could work in the small opening."

A few days after the operation Mr. A's eye was swollen shut and according to plaintiff, Dr. B looked into the plaintiff's eye without an instrument and said, "My God, something's happened! You have panophthalmitis." It was alleged by plaintiff that by reason of the negligence of the defendant doctors in the performance of the operation in question, there ensued an irritation of the tissues and an infection in the eyeball and eye, which resulted in an inflammation of the eyeball and eye, and panophthalmitis and iritis and other injuries, culminating in the total loss and destruction of the use and sight of the right eye and seriously endangering the plaintiff's left eye so that for several months the plaintiff was threatened with total blindness.

The plaintiff in this action did not present any expert testimony as to the diagnosis being incorrect nor as to what method or means in the exercise of ordinary care and skill, other than that used by the operating physicians, should have been employed.

In absolving the defendant physicians of any liability, the court followed the well-known rule on the subject of the care and skill required of physicians in the treatment of patients, stating that the law requires of the physician only that he shall have the degree of learning and skill ordinarily possessed by physicians of good standing, practicing in that locality, and that he shall exercise reasonable and ordinary care and diligence in treating the patient and in applying such learning and skill to the case. The court continued saying that "the law takes cognizance of human weakness and liability to err in the application of skill and learning, and it requires only the exercise of reasonable and ordinary care and diligence to avoid error."

The plaintiff based his action on the theory of negligent diagnosis and operative technique on the part of the defendant doctors, claiming there was error in locating the position of the foreign object and error in the determination that it was not magnetic. The court stated that a case of mistaken diagnosis does not render a physician liable, saying that "when due care, diligence, judgment and skill are exercised, a mere failure to diagnose correctly does not render a physician liable." The court concluded by saying that before the plaintiff can recover, he must show by expert testimony that the defendants failed to use the degree of care and skill ordinarily exercised by other surgeons in their locality.



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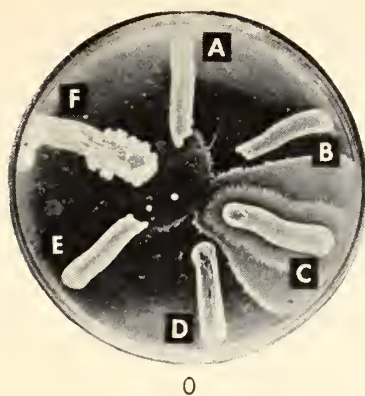
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Pinger, Robert R., *Concord*

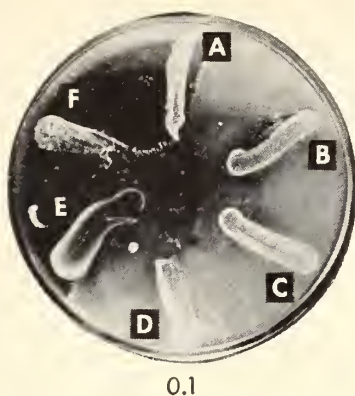
Los Angeles County (143)

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Allin, John G., *Pasadena*
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King, Don R., *North Hollywood*
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Kwong, Mon Quong, *Los Angeles*

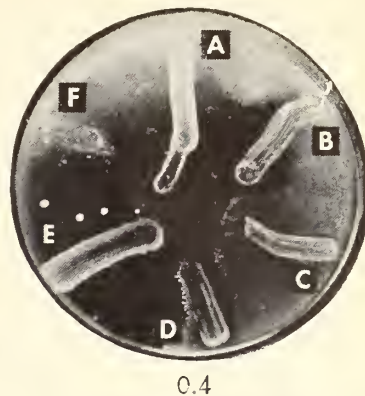
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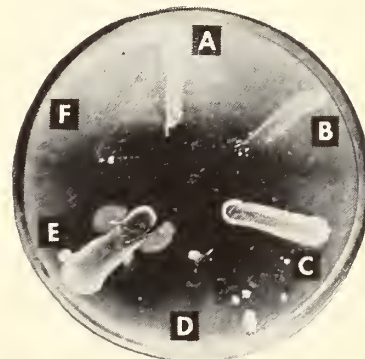
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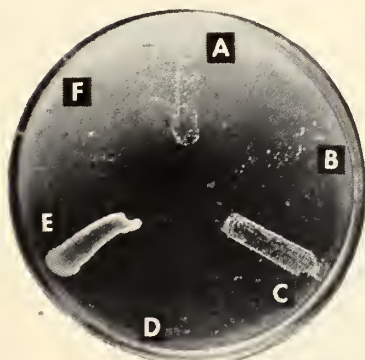
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Antibacterial Activity of STREPTOMYCIN

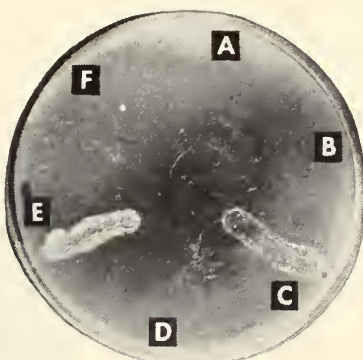
KEY TO PHOTOGRAPHS: • A. *Escherichia coli*
B. *Eberthella typhosa* • C. *B. prateus* • D. *Klebsiella pneumoniae*
E. *Bacillus pyocyaneus* • F. *Mycobacterium tuberculosis*
The numerals indicate micograms of Streptomycin per cc. of agar.



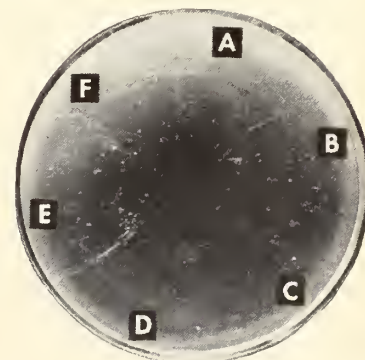
1.6



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26.



104.

THESE photographs show the inhibitory action of increasing concentrations of Streptomycin on a strain of six representative organisms *in vitro*. Inhibitory levels of concentration vary significantly with different strains.

Streptomycin exhibits a wide range of antibacterial activity *in vitro* and *in vivo* against both gram-positive and gram-negative organisms. Clinical results do not necessarily parallel *in vitro* activity or therapeutic results in experimental animals.

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¹ Tillet, W. S., Cambier, M. J., and McCormack, J. E.: The Treatment of Lobar Pneumonia and Pneumococcal Empyema with Penicillin, *Bull. New York Acad. Med.* 20:142, March, 1944.

² Armstrong, S. H., Jr.; England, A. C., Jr.; Favour, C. B., and Scheinberg, I. H.: Anemia and Hypoproteinemia Complicating Severe Protracted Pneumonia: Treatment with Penicillin—Role of Specific Supportive Therapy in Recovery, *J.A.M.A.* 127:303 (Feb. 10) 1945.

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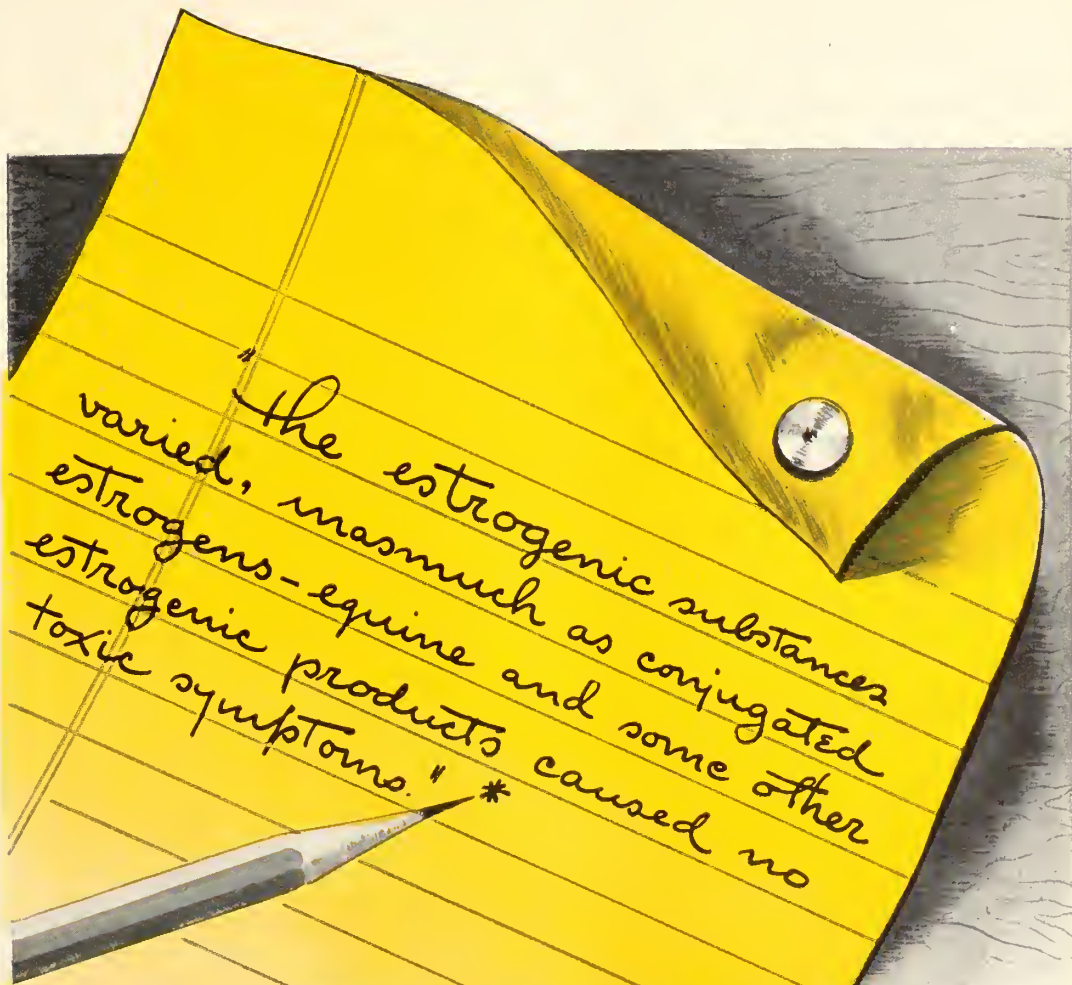


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*Harding, F. E.: Am. J. Obst. & Gynec., 51:660 (May) 1946



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(Continued on Page 50)



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But we find ourselves in an even more trying predicament.

Production of AMINOIDS* is up more than 100% over last year and still we are not able to keep up with the demand.

We are improving and extending production facilities as rapidly as post-war conditions permit. Meanwhile we are trying to distribute our output as equitably as possible. We hope we shall soon be able to fill every order promptly. Your understanding of our predicament and your continued friendly cooperation will be appreciated.

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ALLERGY TESTS SHOULD PRECEDE NASAL SURGERY, DOCTOR STATES

Allergy tests should precede surgery in doubtful cases of chronic nasal obstruction, according to E. A. Thacker, M.D., of the Carle Hospital Clinic, Urbana, Ill.

Writing in the July 27 issue of *The Journal of the American Medical Association*, Dr. Thacker cites as an example one patient who underwent 10 operations on the nose, including removal of small tumors on several occasions. He appeared at the clinic expecting further nasal surgery since his nose was again blocked with tumors. When tests were made it was found that he showed an allergic reaction only to dog dander. After elimination of eight dogs from his immediate environment the tumors and nasal blockage disappeared.

The author cites other investigators who found that of

(Continued on Page 52)

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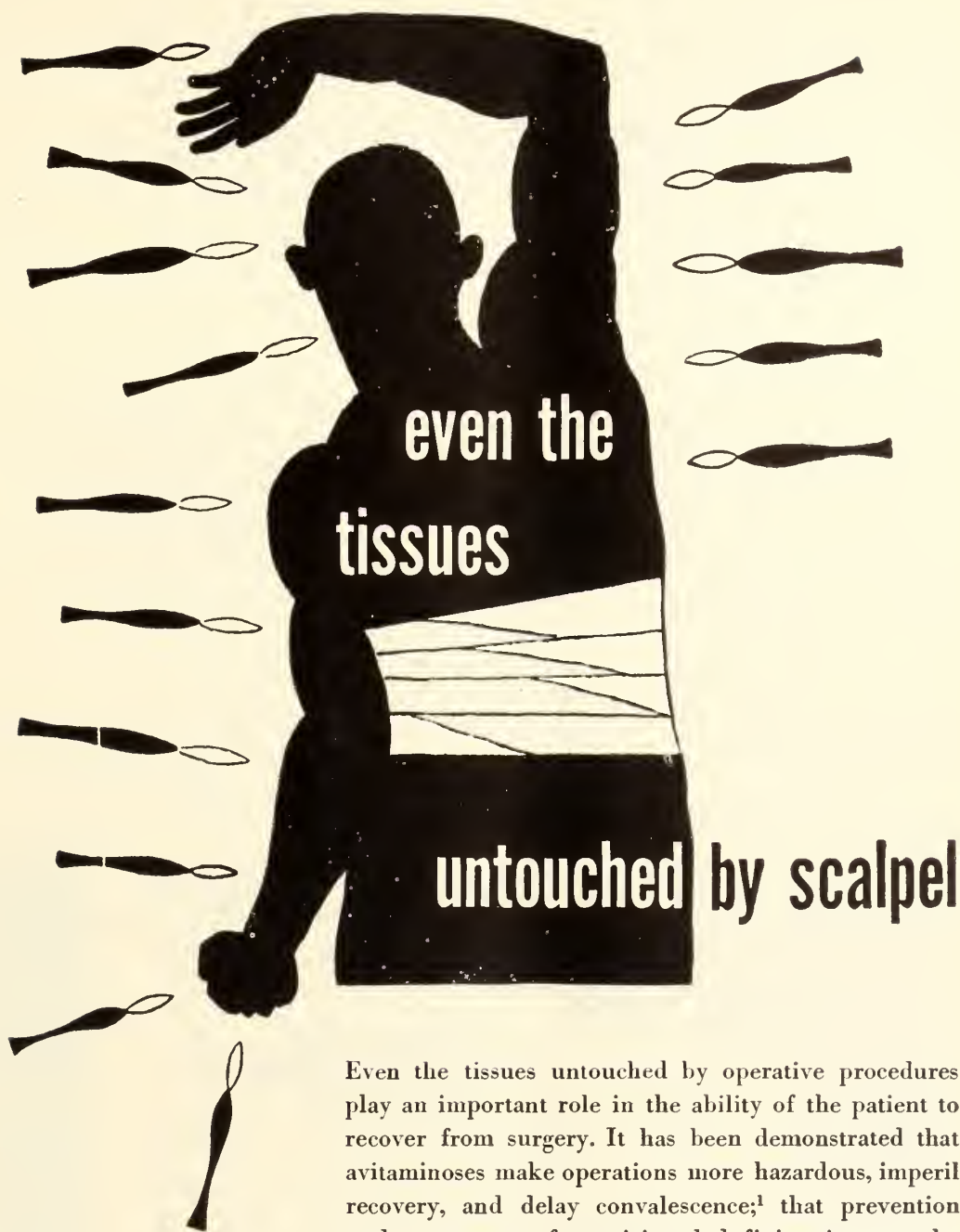


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1. Virginia M. Monthly, **72**:240 (June) 1945.
2. Am. J. Surg. **54**:299 (April) 1942.



FINE PHARMACEUTICALS SINCE 1886

U P J O H N V I T A M I N S

ALLERGY TESTS SHOULD PRECEDE NASAL SURGERY, DOCTOR STATES

(Continued from Page 50)

1200 patients with frequent colds who underwent treatment to acquire immunization to colds, 80 per cent were allergic or were from allergic families.

Of 170 cases investigated, Dr. Thacker noted complete relief or appreciable improvement in 63 per cent after elimination of the allergens from the patients' immediate environment. Desensitization with specific allergens relieved another 7 per cent. Surgery was performed only where it was absolutely necessary. Results were excellent, with only 2.3 per cent of the patients in the whole series failing to obtain relief.

In the author's opinion swelling and poor ventilation due to nasal allergy make a good hotbed for repeated in-

fection and eventually changes take place which lead to permanent trouble. Sinuses may be examined by x-rays and if they appear cloudy then the patient is a victim of an allergic constitution. The patients frequently have an infection in these sinuses which stems from another cause.

Contrary to the belief of many allergists who state that the majority of nasal symptoms are due to inhalants and that gastrointestinal disturbances are due to food allergens, Dr. Thacker says that "this series revealed that about one-half of the cases of chronic nasal allergy were due to both inhalants and ingestants [food and drink taken into the stomach], approximately one-fourth were due exclusively to inhalants, and a like number were due to foods alone. Inhalant allergens must not be overlooked as the cause of associated gastro-intestinal disturbances, nor ingestants as factors associated with upper respiratory symptoms."

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5	'PROTHRICIN' Antibiotic Nasal Decongestant also contains 'Propadrine' hydrochloride (1.5%), a highly efficient vasoconstrictor, notably free from undesirable side-effects of ephedrine and its analogs.



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PHYSICIANS REVIEW INFANTILE PARALYSIS AND ITS TREATMENT

With poliomyelitis spreading to epidemic proportions in various sections of the country, the spotlight of medical science today is focused on this crippling disease which the American Orthopedic Association says was first described by a London physician in 1784.

The August 24 issue of *The Journal of the American Medical Association* publishes a brief primer of the disease and its treatment which was prepared by the following committee of the American Orthopedic Association: Drs. Robert W. Johnson, Jr., Baltimore; A. Bruce Gill, Philadelphia; Edward L. Compere, Chicago; William T. Green, Boston, and H. R. McCarroll, St. Louis.

The five physicians say that "since the elimination or curbing of the great epidemic diseases of childhood, such as smallpox, diphtheria and summer complaint, no disease has created greater apprehension among people than infantile paralysis—not because of its mortality or even its incidence rate in epidemics but because it may produce such tangible and lasting crippling in the victim it does claim."

Review History of Disease

In reviewing the history of poliomyelitis or infantile paralysis, the doctors state that it was not until 1909 that investigators discovered the disease was caused by a virus—a minute, living organism which is so small that generally it cannot be recognized by means of the strongest microscope.

"Much careful and difficult investigation, clinical, epidemiologic and experimental, has been carried on in the 37 years since the discovery of the virus character of poliomyelitis, and progress has been steady," the primer says, adding: "Valuable information has been accumulated but as yet certain essential knowledge has not been won as to its transmission, its mode of invasion of the central nervous system, the tissue reactions of the host and the development of an active or passive immunity. These are the real goals which science strives to reach; for far more important than the necessary and appealing rehabilitation of the paralytic is the elimination of the infection or the positive protection of the child from the disease in the first place."

Primer Summarizes Scientific Facts

The primer sets out these facts about the disease:

Infantile paralysis is world-wide in distribution but it is more prevalent in temperate climates. It is a disease of summer and autumn, though occasional cases may occur during any month of the year.

It is a disease of childhood, although it may occur at any age from infancy through maturity. About 60 per cent of the patients are under 10 years of age, while over 80 per cent are under 15. The incidence is somewhat higher in boys than in girls, although in adults there is no such sex variation. Race and color are not significant.

While some epidemics have occurred in large metropolitan areas, when the total cases for the whole country are reviewed it can be seen that it is primarily a rural disease.

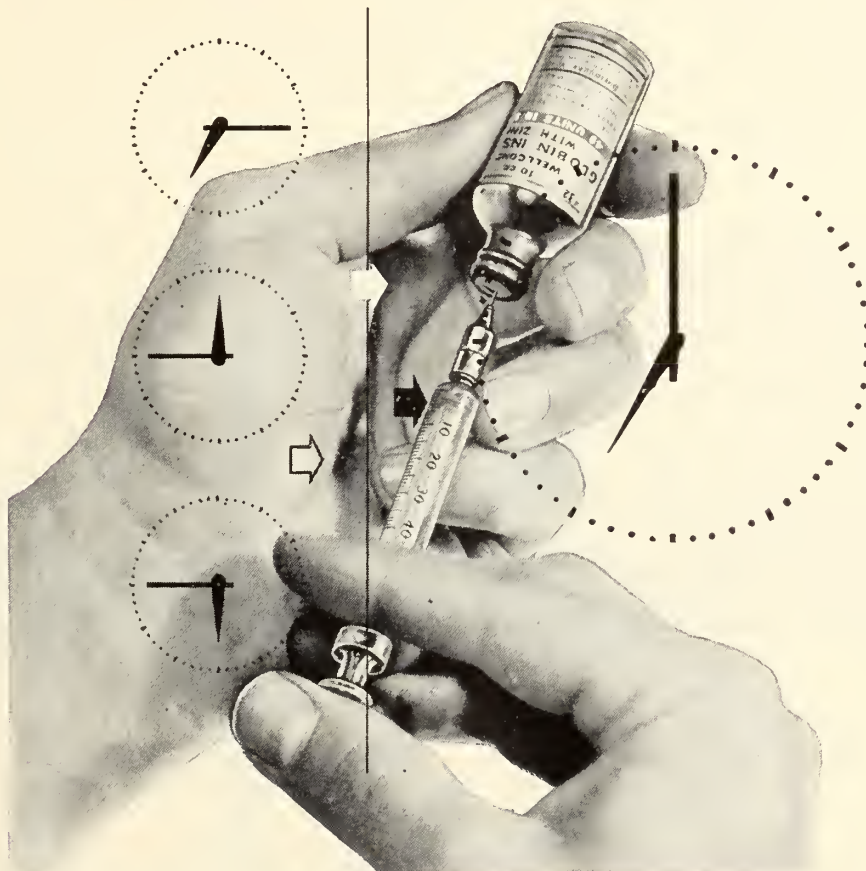
It was once suspected that the virus entered the body through the nose and the mouth, but investigators since have been giving more attention to the alimentary tract. The virus in quantity has been found in stools and in sewage. Healthy carriers of the virus with heavy infestation of the stools are a well-known feature.

Tips to Guard Against Disease

Incidence of the disease is far higher proportionately in pregnant than in nonpregnant women of the same age.

(Continued on Page 56)

How to shift to 'WELLCOME' GLOBIN INSULIN from 3 injections to 1 a day...



A relatively simple procedure can make the unique advantages of intermediate-acting 'Wellcome' Globin Insulin with Zinc available to patients on regular insulin (crystalline or amorphous). Three steps can change the patient from two or more injections daily to one injection a day.

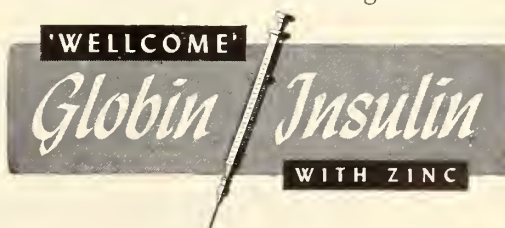
STEP 1 The initial daily dose of 'Wellcome' Globin Insulin with Zinc should be approximately $\frac{2}{3}$ the total number of units of regular insulin previously given daily.

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Available in 40 and 80 units to the cc., vials of 10 cc. 'Wellcome' Trademark Registered.



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PHYSICIANS REVIEW INFANTILE PARALYSIS AND ITS TREATMENT

(Continued from Page 54)

Tonsillectomy also seems definitely to predispose to infection. Excessive exertion or fatigue appears to be a possible precipitating factor.

The incubation period—the time which elapses from exposure to the disease until the first symptoms develop—varies from seven to 21 days. In one patient, however, the virus appeared in the stool six days after contact, yet the patient did not develop the disease until the 25th day.

Second attacks are very, very rare but they have been reported. They can be induced experimentally in monkeys, showing that immunity from previous attacks is not absolute.

There is as yet no absolute proof of an intermediate

host or animal pool, no known insect agent of transmission, no definite portal of entry or recognizable initial lesion or wound, or, in fact, any typical lesion outside the central nervous system, or any precipitating or sensitizing factor.

Warning Given to Children

Children who are well should be warned against getting in crowds, especially indoors. They should be told, too, about the dangers of swimming in pools and streams that are subject to pollution. Travel and over-exertion are to be avoided.

The milk and water supply and the general sanitation of the community should be carefully checked, especially sewage disposal. Anti-insect measures are impracticable in rural areas, where most cases originate, but much

(Continued on Page 58)



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 "... is quite effective
 in the clearing of nasal
 congestion due to
 allergy or infection "*

Feinberg, S. M.: Allergy in Practice,
 Chicago, The Year Book Publishers, Inc., 1944, p. 502.

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 The Inhaler may make all the difference between weeks of acute
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Benzedrine Inhaler
a better means of nasal medication



Smith, Kline & French Laboratories, Philadelphia, Pa.

PHYSICIANS REVIEW INFANTILE PARALYSIS AND ITS TREATMENT

(Continued from Page 56)

can be done to protect food supplies in stores and homes from contamination.

The onset of the disease is very similar to that of many other acute illnesses. At first the patient has what appears to be an inconsequential illness which is non-specific in type, associated with a variable amount of fever, usually not very high and lasting 24 to 36 hours. Following this the patient has a normal temperature for from one to eight days, on the average two or three days, and he feels well or relatively well, only to develop a more severe type of acute illness which is associated with evidence of involvement of the central nervous system. In the second phase of the illness, headache may be very severe in adults, although this is not so likely

in children. Muscle soreness appears in various areas but usually first in the neck and back, where a feeling of stiffness may be described. Straight leg raising becomes very limited, as does forward flexion of the neck and back. Paralysis is likely to occur on the second to the fourth day. It ordinarily reaches its maximum extent within 48 to 72 hours after it appears, although certain patients have continued fever and progressive paralysis for several days, even to fatal termination. Once the fever has returned to normal for 24 hours, it is unusual for further paralysis to occur.

The average mortality in recent epidemics in this country has been seven to eight per cent. In general the death rate in recent years has been lower than in earlier epidemics.

On the whole, the prognosis in poliomyelitis is favorable, and one may agree with one author who states that "with good care 75 to 85 per cent of the cases will show marked improvement or complete recovery."



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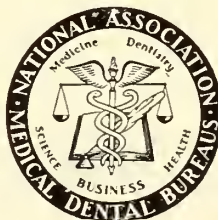
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5 Edema 2.7	Popular cigarette #3 (ordinary method)
6 Edema 2.7	Popular cigarette #4 (ordinary method)

CONCLUSION:* Results show that regardless of blend of tobacco, flavoring materials, or method of manufacture, the irritation produced by all ordinary cigarettes is substantially the same, and measurably greater than that caused by PHILIP MORRIS.

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*N. Y. State Journ. Med. 35 No. 11,590 **Laryngoscope 1935, XLV, No. 2, 149-154

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DIPHTHERIA MORTALITY IN 1945 HIGHEST FOR PAST FIVE YEARS

The number of diphtheria deaths in 93 large U. S. cities has increased by 108 over the low 213 figure of 1941, according to the 21st annual report on diphtheria mortality appearing in the July 27 issue of *The Journal of the American Medical Association*.

This three year report, covering 1943, 1944 and 1945, states that for the 88 cities for which data are available since 1923 there occurred 311 deaths from diphtheria in 1945, more than for any single year since 1939.

"War travel may have been an influence in increasing the incidence of diphtheria, especially on the Pacific coast," the report explains. "The liberal policy of accepting cases from surrounding suburban and rural areas has been an influence in the South, where there is definite evidence of delay in diagnosis, care and treatment before hospitalization is requested. The increase in deaths is very spotty. . . . There seems to be a slight tendency for diphtheria to become relatively more prevalent among the higher age groups. Infants should be protected before their first birthday, and booster protective treatments should be given at time of school admission and later in life when conditions indicate that it is desirable."

It is pointed out in the report that the 14 New England cities (population 2,579,152) have failed during the past five years to equal the low point of six deaths in 1940 (11 in 1941, 11 in 1942, 12 in 1943, nine in 1944, eight in 1945). The death rate for the group as a whole has increased slightly from 0.23 in 1940 to 0.31 in 1945.

The 18 cities (population 13,129,185) in the Middle Atlantic states continue to hold first place. The group rate of 0.20 is higher than that of 1944 (0.11), when these cities set an all time low for any group. In 1944 there were but 15 deaths, in 1945 there were 26 deaths in this group, 41 in 1943 and 23 in 1942. Twelve cities report no diphtheria deaths for 1945.

The number of deaths in the nine cities originally included in the South Atlantic states (population 2,727,985) declined from 27 in 1941 (rate 0.99) to 17 in 1942 (rate 0.62) and 18 in 1943 (rate 0.66) but has increased to 30 in 1944 (rate 1.10) and 39 in 1945 (rate 1.43). During the five years 1941-1945 there occurred 131 deaths. Norfolk and Richmond are on the 1945 honor roll for no diphtheria deaths.

The 18 original cities in the East North Central group (population 9,386,378) report an increase of 13 deaths over 1944 (65 in 1945, 52 in 1944, 97 in 1943, 69 in 1942). Nine of these cities report no death from diphtheria in 1945 (there were seven such cities in 1944, 10 in 1943 and 1942). Chicago reports a most striking reduction in diphtheria deaths (three in 1945, five in 1944, 53 in 1943, 43 in 1942, 34 in 1941). Detroit, on the other hand, records an increase in diphtheria deaths (21 in 1945, 17 in 1944, 11 in 1942 and seven in 1941).

The six cities in the East South Central states (population 1,286,747) report a decided increase in diphtheria deaths. In 1945 in this group of cities there were 41 deaths (in 1944 there were 22 deaths, eight in 1943, 12 in 1942). The group rate decreased from 0.93 in 1942 to 0.62 in 1943 and then increased to 1.71 in 1944 and 3.18 in 1945. This is the highest of all group rates for 1945, the cities of the West South Central area following next (rate 2.48) and the cities of the Mountain and Pacific area next (rate 1.74).

The nine cities in the West North Central states (population 2,716,484) have maintained a fairly consistent rate during each of the past four years but higher than that for 1941 (0.66 in 1945, 0.74 in 1944, 0.55 in 1943 and 1942, 0.18 in 1941). In 1945 there occurred 18 deaths (there were 20 in 1944, 15 in 1943, 15 in 1942, five in 1941). Four cities are on the 1945 honor roll (there were three in 1944, one in 1943).



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PENICILLIN-MALARIA TREATMENT EFFECTIVE FOR LATE SYPHILIS

Concurrent administration of penicillin and inoculation malaria is the most effective treatment for patients with dementia paralytica, late syphilis of the central nervous system which leads to insanity and paralysis, according to three Baltimore doctors writing in the August 17 issue of *The Journal of the American Medical Association*.

Frank W. Reynolds, Charles F. Mohr and Joseph Earle Moore began studying the effects of penicillin in various forms of neurosyphilis at the Johns Hopkins Hospital in October, 1943, with the cooperation of the United States Public Health Service Venereal Disease

Research and Postgraduate Training Center.

The physicians state that "as of December, 1945, 41 patients with dementia paralytica have been treated with penicillin. Twenty-four of these patients (group A) received penicillin alone in amounts ranging from 2,000,000 to 10,000,000 units in divided doses; the remaining 17 patients (group B) received from 2,000,000 to 4,280,000 units of penicillin in divided doses concurrently with induced tertian malaria."

Treatment consisted of day and night injections of commercial penicillin into the muscles of the patients. Fifty per cent of those in group A (24 patients) showed improvement in body weight, speech, tremor and handwriting after penicillin treatment. Eleven of this group

(Continued on Page 68)

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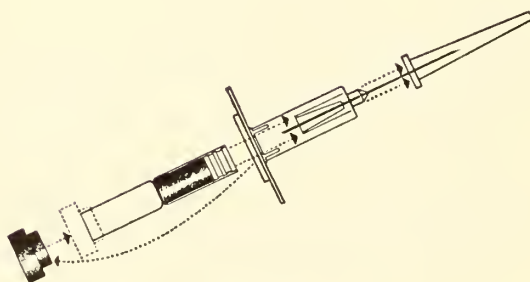
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PENICILLIN-MALARIA TREATMENT EFFECTIVE FOR LATE SYPHILIS

(Continued from Page 65)

(46 per cent) also showed improvement in their mental status. On the other hand 75 per cent in group B, treated with penicillin and malaria, showed these general signs of improvement; while at least 10 of the 17 patients (53 per cent) were improved in their mental status.

"Our results with concurrently administered penicillin-malaria treatment are, we believe, so superior to those with penicillin alone in the treatment of dementia paralytica that it is our present conviction that the former is the treatment of choice," the authors say. "Treatment with commercial penicillin alone may be valuable for patients whose age and general physical condition preclude the use of malarial therapy."

NAILS REVEAL UNUSUAL OR ABNORMAL TENDENCIES IN PATIENTS

To the experienced eye of the physician fingernails reveal many things about a patient, according to Everett T. Duncan, M.D., recently discharged from the Army Medical Corps. He specialized in diseases of the skin at the New York Skin and Cancer Unit before his entry into the Army.

Writing in the current issue of *Hygeia*, health magazine of the American Medical Association, the author states "physicians often glean some indications of unusual or abnormal tendencies of a patient by inspecting the nails. Notice the closely bitten nails of nervous, high-strung nail biters; the blue nails and bulbous fingers of people afflicted with heart ailments or chronic lung disease; the transverse ridges prominent after a severe illness such as scarlet fever; the pitting of the nails in psoriasis; the color changes and undermining of the plate in fungous infections, and the brittleness and separation from various causes."

The author makes the following suggestions for nail care:

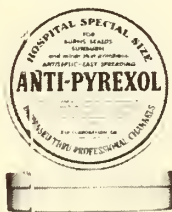
"White spots, or, in medical parlance, leukonychia, are due to air in the nail substance resulting, perhaps, from too vigorous pushing back of the nail base in manicuring or other minor injuries. Total whiteness of the nail is rare and may be hereditary or the aftermath of severe toxic conditions. Treatment consists of avoiding such rough pressure as might occur from using an orangewood stick. An advisable form of cuticle care for one susceptible to this condition is to wipe the borders of the soft tissues with an oiled damp cloth while they are soft.

"Brittleness of the nails may be congenital or acquired. Suggested causes are mild, repeated trauma as in typing, vitamin A deficiency or the use of nail polish removers containing acetone. Today, buffing with an abrasive is not used as formerly. Files or emery boards should be avoided to prevent aggravation of a splitting or peeling tendency. In these cases the nail should be clipped behind the split area.

"Nails cannot be nourished from without, but daily applications of a bland oil may prevent brittleness when the condition is not due to an infection. Oil cannot strengthen the nails. Excessive immersion of the hands in soap and water is to be avoided in cases of soft nails and those that are separated or infected."

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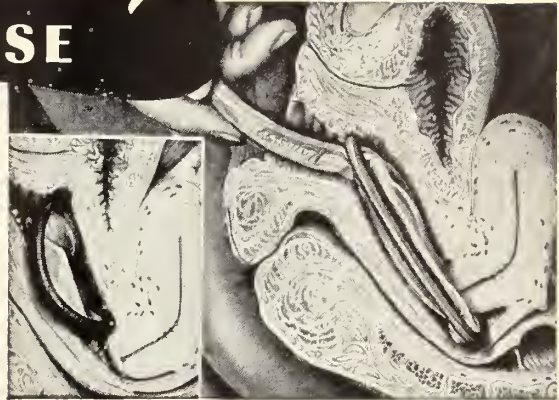
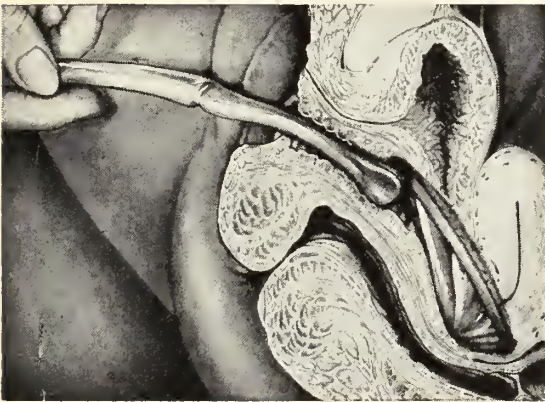
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60 PER CENT OF 4,666 MEDICAL SCHOOL FRESHMEN ARE WAR VETS

The American Medical Association announced recently that 60 per cent of the 4,666 students who have been selected as freshmen to enter medical schools and schools of basic sciences in the United States in 1946 are war veterans.

The freshmen students selected up to June, 1946, included male veterans 2,816 (60 per cent), physically disqualified men 501 (11 per cent), occupationally deferred men 312 (7 per cent), men under 18 years 41 (1 per cent), other men 429 (9 per cent) and women 567 (12 per cent).

These figures were contained in the 46th annual report on medical education in the United States and Canada by the Council on Medical Education and Hospitals of the American Medical Association. The report is published in the August 17 issue of *The Journal of the American Medical Association*.

Victor Johnson, M.D., secretary of the council, who prepared the report with the assistance of F. H. Arestad, M.D., and Anne Tipner, said that the large number of war veterans in this year's class "must be attributed to the unexpectedly short time which elapsed between V-E day and V-J day and the consequently rapid demobilization of the Army and Navy."

Commenting on the veteran admissions, Dr. Johnson raised these questions:

"How many of them were rejected for admission to medical schools before entering military service? Do they possess sufficient motivation in medicine to meet the rigorous demands of the study of medicine? Only time will answer these questions."

Continuing, his report said:

"Every one would be pleased should the answers prove favorable to the veterans, not merely for the sake of the veterans themselves, but also in terms of the future medical care of the people. Admission of a student to medical school is the first step in that person's being given the serious responsibility of guarding the life and health of his patients. Such admission, therefore, is a serious responsibility of the medical schools.

Women Medical Students

"The proportion of women admitted to 1946 freshman classes is less striking than might have been anticipated. Twelve per cent of those admitted are women, including 20 veterans. In the past 40 years there never has been an enrollment of as many as six per cent women in all four classes of our medical schools.

Smallest Freshman Class

"The medical schools in this country, having selected 4,666 students for the 1946 entering class, state that 1,079 remain to be selected to complete the projected freshman class. This indicates that the freshman class will number about 5,745. If this number is not exceeded before classes open, this year's freshman enrollment will be the smallest in 17 years.

"Whether the 1946 class will be filled remains to be seen. Almost all schools hope to fill their 1946 freshman class and, in general, they judge the qualifications of those admitted to be about the same as those of freshman students before the war."

The Accelerated Curriculum

The council report said that by June 1, 1946 all but five of the four-year medical schools had completed the three-year cycle of four graduating classes under the accelerated program which was in effect during the war years. Both the Army specialized training program and

(Continued on Page 78)

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60 PER CENT OF 4,666 MEDICAL SCHOOL FRESHMEN ARE WAR VETS

(Continued from Page 74)

the Navy V-12 program have been discontinued.

"It is regrettable that the educational experiment of acceleration could not be carried out under more favorable conditions," the report said, adding: "There is a tendency to ascribe all the deficiencies of wartime medical education to the accelerated program. Other important deleterious influences were operating entirely independently of acceleration in the medical schools. Among these were shortages of teaching staff, increased enrollments, inadequate premedical preparation and a state of uncertainty in the minds of students as to their future. Could the experiment have been conducted in the absence of these variables, perhaps the reaction against acceleration would now be less widespread."

The council said that by 1947, at which time all sched-

uled extra graduations will have been completed, the wartime medical school program will have produced an estimated extra 7,214 physicians.

"The effect of this program on the outcome of the war cannot be stated in other than general terms," said the council, "but it is clear that this effort was a major contribution by the medical schools and their depleted and overworked faculties."

New Medical Schools

The council's report said in part:

"There are two institutions which are well on the way toward establishment of entirely new medical schools. These are the University of Washington, which is organizing a medical school in Seattle, and the University of California, which will establish a school in the Los Angeles area as a part of the Los Angeles branch of the university. In Canada, a new medical school has been established by the University of Ottawa.

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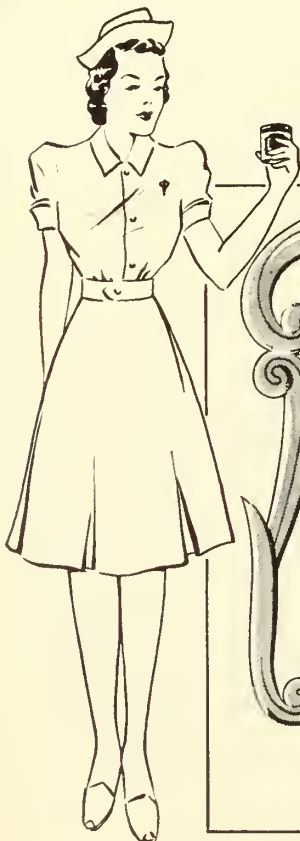
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VOL. 65

OCTOBER, 1946

NO. 4

Human Reactions to Experimentally Induced Impact Forces*

H. R. BIERMAN, *Commander, MC, USNR, Bethesda, Md.*

THIS paper applies to any field of medicine where the application of force causes injury. Current investigations in the Acceleration Unit at the Naval Medical Research Institute have implications which go beyond the bounds of aeronautics. Applications of these studies to many types of trauma are now evident. During the war, the problem of aircraft crashes was paramount, but because of circumstances it was a difficult problem to attack except from a preventive angle.

Within the past ten months studies of a fundamental nature have been undertaken on mechanical forces. These forces can be thought of as the etiologic agent of trauma. They have a definite structure just as bacteria or known viruses possess certain characteristics. A force can be described by its magnitude, duration, and pattern. A force even has an "incubation period" in that a certain time is required before its effects become clinically apparent. True, this incubation period is measured in milliseconds rather than days or weeks, but none-the-less it is a definite period. Forces, if large enough, may cause injury, or, if small, may be without physiological effect. They can be applied for long durations. Forces may be smoothly applied or may possess many irregularities or oscillations. The type of force greatly influences the sequence which follows, and a resistance to some types of forces can be developed. The treatment with which we are concerned is mainly that of prophylaxis, or alteration of the force so that the individual can tolerate a given amount of energy without injury. All these circumstances determine the effect of a given force upon the human.

It is known that some individuals have sur-

vived forces calculated to exceed 200 G.⁵ These are usually referred to as "lucky" or "miraculous" escapes. But if one dares the damnation of superstition, it is evident that in the scientific world, luck or a miracle do not exist, per se. We feel that in such cases a peculiar train of physical events occur, rare to be sure, but none-the-less effective in permitting survival of an otherwise fatal accident.

One of the approaches to this problem has been to study these so-called lucky sequences with an ultimate goal of devising an apparatus or garment which can channel the force of a given acceleration into a preferred path and prevent injuries and fatalities.

It is reasonable to assume that the accelerations involved in aircraft crashes are not uniform. Therefore, in considering any procedure for protecting individuals from injury during such crashes, one must of necessity interpret the simple physical formulae for acceleration with caution.

One fact which stands out in crashes of military aircraft is that up to reasonably high forces (about 60 G), despite destruction of the wings, tail, under-carriage, and engine, the cockpit usually remains intact. (Fig. 1.) The fear of telescoping of the aircraft to crush the occupants, so common in the early days of aircraft construction, no longer exists in most military and a fair number of civilian aircraft. The aircraft industries have altered the pathogenesis of injury by more modern methods of construction so that personnel are now injured or killed in crashes by being flung about within an intact cabin or cockpit area. This factor is most evident in crashes aboard aircraft carriers where the entire sequence from before, during, and after a crash is followed by observers aboard the ship and can be photographed in slow motion. A study of these sequences has shown

* The information contained herein is that of the author and not necessarily the policies of the United States Navy.

that it should be possible to protect individuals within the cockpits of aircraft which remain intact during crashes involving large forces. This, of course, is of great importance to personnel flying in aircraft and not actually in control, such as the passengers in a transport plane.



Figure 1.—Corsair which crashed during field carrier practice from 50 ft. at approximately 80 miles an hour. The wings, tail, engine and under carriage are demolished yet the cockpit is intact.

In the summer of 1945, the impact decelerator¹ was devised and with this instrument we have been able to study the reactions of humans under impact forces. All investigations were carried on, using ourselves and other volunteers as subjects.

In military aircraft, the pilot is secured in his seat by means of a restraining harness, i.e., shoulder straps and seat belt. If a plane is involved in a crash, sudden deceleration occurs, the plane stopping rapidly, usually within ten to forty feet. Provided the seat remains secured to its foundations, the individual is thrust against the shoulder straps and seat belt. Thus, the force of deceleration is applied largely to the individual's thorax and abdomen by means of this restraining device.

A similar effect may be obtained by suddenly jerking the restraining harness back against the individual. This enables the subject to receive an impact force with relatively little motion so that the investigator can closely observe him throughout the exposure. I can tell you that this was a most important factor during these initial studies for we were embarking on an entirely new field with little previous experience to afford any assurance as to the immediate outcome or as to injuries which might develop at some later date.

To do this, the impact decelerator was conceived in its rather simple form. To produce the necessary impact force, falling weights were used (Fig. 2). The weights are raised to a predetermined height and, upon a given signal, are released. They are arrested at the bottom of their fall by a plate fixed to a 65-inch steel rod, which then transmits the force back up the rod through the restraining device to the thorax and ab-

domen. Physiological measurements of respiration, electro-cardiographic tracings, ear pulse, ear opacity, peripheral pulse configurations, blood pressure and intra-abdominal pressures may be recorded simultaneously with the physical data of the force and time.

The respiratory pattern has been successfully recorded by inserting a thermo-couple, appropriately shielded, in each nasal air-way (Fig. 3). These elements are small, possess little inertia because of their small mass (they weigh less than 5 grams each) and they are extremely sensitive. During inspiration, the thermo-couples are exposed to the temperature of the environmental air. During expiration they record the temperature of the air coming from the lungs. Mouth breathing does not materially alter the pattern although nasal breathing is preferable.

The use of electrical wire strain gages has proven quite a boon in measurement of small displacements. A wire strain gage consists of fine wire placed against a metal surface so that small bending movements of the metal surface will change the resistance of this wire. With an appropriate electronic device these small movements of the metal surface can be recorded. Such a device can be placed over an artery and the pulse configuration can be easily detected. This same device can be used to measure impact pressures, cardiac impulse, blood pressures, and a large number of other physiological phenomena which are adaptable to its peculiarities.

The ear opacity and ear pulse are measured by detecting the amount of light transmitted through the ear to a photoelectric cell. The changes in the

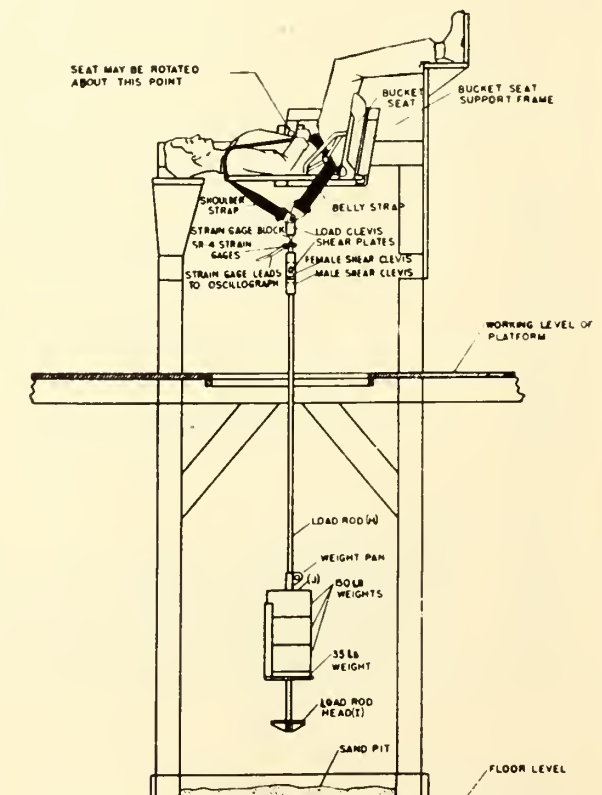


Figure 2.—The Impact Decelerator.

amount of light transmitted are a reflection of the volume of blood and pulse characteristics within the ear at the moment.

It should be emphasized that the stresses produced by airplane crashes and by the impact de-



Figure 3.—Illustration showing plastic cylinders containing thermo-sensitive wire which are inserted into the external nares and are used to record the respiratory pattern.

celerator are comparable, but they are not necessarily identical. When more elaborate investigative methods (such as those involving human catapults, etc.) are available, it will be possible to duplicate more exactly the types of linear accelerative forces occurring in airplane crashes. Until that time the impact decelerator offers a highly useful and convenient technique for studying some effects of these forces.

The impact decelerator applies the forces directly to the subject. In an aircraft crash the forces are applied first to the aircraft structure and transmitted to the subject only through the seat and its attachments to the restraining devices. During such transmittal of force, there is undoubtedly an absorption of energy in the aircraft structure so that in all likelihood the force applied to the subject is less than the initial force at the point of the impact of the aircraft.

Studies at the Acceleration Unit have shown that it is possible to improve one's tolerance to impact forces. Using the decelerator it has been shown that with the current regulation harness the human subject can tolerate approximately 2,000 pounds peak impact force delivered within 0.15 second. The area of the current regulation harness is 76 square inches applied to the average thorax and abdomen. When this area of coverage

is increased to 156 square inches by the use of a vest-type restraining harness, the tolerance limit is then increased to 3,300 pounds. Beyond this point we have seen ligamentous detachments, muscular and costochondral separations, and hematomas into muscle groups. These findings together with untoward physiological changes are used as the criteria for the limit of tolerance to impact forces.

It then became evident that if any significant increase in protection against impact forces was to be attained, it would take more than just increase of area and distribution of force. It had been shown in previous studies that the distribution of the force in the current regulation harness was not uniform despite the fact that the straps themselves were of uniform width. (Fig. 4.) Thus the greatest force was concentrated at an area in the vicinity of the umbilicus near the coeliac plexus which as you know is quite sensitive to impact forces, and can easily produce temporary incapacitation. During water landings at sea, pilots have been observed in the cockpit to be dazed and, when the plane sinks, to make no apparent effort to escape. The same applies to the fire hazard following crashes ashore. When these individuals are recovered, often little if any positive findings other than simple drowning or burns can be made. We feel that it is possible that these individuals have been momentarily stunned by a concentration of the impact in the neighborhood of the coeliac plexus despite the fact that the

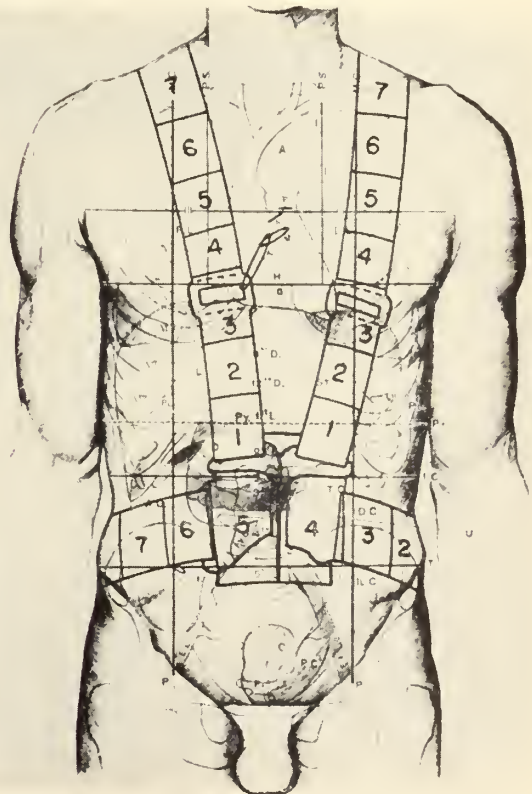


Figure 4.—Composite schematic drawing to illustrate the pressure distribution. The impacts produced maximal pressure forces at positions 6 and 7 on both shoulder straps. The maximal pressure areas on the seat belt were found at positions 4 and 5.

force of the crash is not excessive. Therefore, it is necessary to find some way to equalize the distribution of the force over this increased area to prevent concentration at certain vital points. This can be obtained by utilization of a material which will allow the body to form-fit into the harness during the impact.²

Further investigations on the impact decelerator, including high speed cinematography, afforded an opportunity to observe the effects of the early part of the impact. The rate of loading was found to bear a critical relationship to the subject's tolerance toward maximal loads.³ Rapid applications of the force, attaining a peak in less than 30 or 40 milliseconds, were uniformly disliked. In general, the slower rates of loading were preferred. An optimal rate of loading exists, however, since slowing the rate of loading too much may cause a reduction in tolerance.⁴

SUMMARY

1. The possibility exists of surviving high impact forces in crashes in military aircraft.
2. The magnitude and duration of a given force in part determines its effect upon the body. Increasing the area of distribution of a force reduces the untoward effects upon subjects.
3. Forces should be distributed to those areas

of the body more capable of withstanding these forces.

4. The rate of loading bears a critical relationship to the tolerance of the subject to impact forces.

5. Small oscillations and irregularities in a force are disagreeable to subjects.

6. Force is the etiological agent of trauma, and as such requires much further investigation of a fundamental nature.

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FIVE PHYSICIANS WARN AGAINST USE OF NEW DRUG FOR EPILEPSY

The new drug tridione, widely acclaimed for the treatment of epilepsy, has been found to carry an unpredictable toxic reaction and five physicians, writing in the September 7 issue of *The Journal of the American Medical Association*, warn that the public should not be allowed to buy the drug without a prescription.

While tridione has been tried and found effective in the treatment of hundreds of epileptic patients with no apparent ill effects, two women are known to have died as a direct result of administration of the drug. Their case histories are reported in two separate articles in *The Journal*.

One case is reported by Drs. Francis F. Harrison, Roswell D. Johnson and Darrell Ayer, of Cooperstown, N. Y., and the other by Drs. Roland P. Mackay and Werner K. Gottstein, who are from the Department of Neurology and Neurological Surgery, University of Illinois College of Medicine, Chicago.

Both patients died from a disease known as aplastic anemia. This condition often develops in persons who are poisoned with benzene or similar substances, or who have worked too long with radium or x-rays. One of the chief symptoms of the disease is deficient blood cell formation.

The Cooperstown doctors say their patient, a 16-year-old girl who had suffered from convulsive seizures for three years, died following the use of tridione and hydantoin. The treatment, they say, was successful in controlling the attacks, but the patient gradually began to notice difficulty in breathing, palpitation on exertion, unusual fatigue, and a throbbing sensation in her head. The patient later suffered hemorrhages. All the measures used to prevent and treat infection, stimulate blood cell production and arrest bleeding proved of no value.

The two Chicago doctors say their patient was a 23-year-old unmarried woman who had suffered convulsive

seizures since she was five years old. After repeated major convulsive seizures, tridione was administered. Later she suffered from severe headaches, with vomiting, generalized weakness and fatigue. Autopsy revealed extensive hemorrhages throughout the body.

In discussing the case, Drs. Mackay and Gottstein say: "There is little doubt that death was due to tridione. The only drugs used by the patient for ten months prior to her death were phenobarbital and tridione, and she had taken phenobarbital almost constantly for 19 years without ill effect.

"The destruction of the elements of her blood was delayed but abrupt. The acute onset of her illness came only after ten months, but it came suddenly. These facts strongly suggest a progressive accumulation of the drug, or of toxic fractions of it, in the body. As late as two days before her admission to the hospital she walked several blocks without distress. The process was therefore catastrophic and apparently uninfluenced by vigorous treatment."

After outlining several suggestions to other physicians on the use of tridione, the Chicago doctors say:

"Unprescribed sale of the drug to the public should not be allowed. The present enthusiasm for tridione, both among the profession and with the public, is very great, because of the glowing accounts which have appeared in the scientific and public press, and even on the radio. The public knows the drug by name and can buy it on the market. A doctor's prescription is recommended on the company's labels and should be required.

"Finally, further research with tridione and related substances must be carried out. Despite the unfortunate toxic effects of tridione revealed in this case, the drug offers great promise for effective control of the most stubborn of all convulsive disorders, if its dangers can be avoided. This promise should be fulfilled."

Dermatologic Aspects of Dermatitis Due to Atabrine*

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MY part of this symposium on Untoward Effects of Atabrine will be limited to a brief discussion of the dermatologic aspects of this new clinical entity. It is not my purpose to discuss therapy, the etiology, histopathology or laboratory observations.

While serving at a large naval hospital in the New Hebrides, I observed in the late part of 1944 and the early part of 1945 a group of cases which later were attributed to the effects of atabrine. Here it might be mentioned that, contrary to the belief of some observers, typical lichen planus, histologically and clinically did occur from time to time in the Solomon and New Hebrides areas. This fact, in the beginning, was somewhat confusing when this group of cases was first brought to our attention. All the cases observed were from the New Guinea areas. They occurred in both ship and shore based personnel.

Three types of atabrine dermatitis were observed and for discussion they are divided into (1) Eczematoid type, (2) Lichenoid type, (3) Exfoliative type.

Eczematoid Type: At the onset of the disease, the presenting eruption was varied. In many instances the lesions were merely scaly patches resembling a tinea, or an erythematous papular vesicular eruption confined to the dorsal aspects of the arms and hands and about the neck. Frequently the lesions were edematous and weeping. Bullae were not observed in this particular group. Later, other sites became involved, such as the eyelids, ears, scalp, bearded region and pubes. These early eruptions closely resembled a dermatophytosis with an "id" eruption, a seborrheic dermatitis or eczema. The early eruptions were extremely resistant to therapy. Secondary infections were common. On involution the lesions became dry and scaly, or progressed to the development of the pigmented, flat, or hyperkeratotic lichenoid type. In some of the patients with the eczematoid manifestations, the eruption was confined to the cheeks and nose, closely resembling lupus erythematosus. These patients later developed other lesions on the extremities, which when healed left a thin, dry, slightly scaly atrophic scar.

Nisbet² mentions the involvement of the external ears which consisted of an erythematous vesicular eruption appearing first on the lobes and later involving the rim of the ear. This, he stated, may precede by weeks or months any other manifestations of the disease.

The involvement of the scalp and other hairy parts was rather unusual. There was a patchy alopecia accompanied with a severe inflammatory

dermatitis of the scalp with a resultant peculiar shiny wrinkled atrophy of the skin.

Lichenoid Type: If the lesions went on to the development of the lichenoid type or if this type developed independently there occurred dusky purplish-red papules covered with greyish scales and closely resembling the lesions of lichen planus. These usually were noted first on the dorsal aspects of the hands and the flexor surfaces of the arms and legs, and on the lateral sides of the neck and about the eyes. The papules might coalesce to form raised plaques, or, as the condition continued to spread, new patches appeared with a gradual fusion of involved areas and with a variable extension to the trunk and scalp. The papules tended to become verrucous and assume a pigmented appearance. In some cases, there was a generalized eruption consisting of small follicular papules which were acuminate and reddish brown, about pin-head in size and topped by a horny plug. This was accompanied with a mark scaling and erythema of the scalp and was associated with a hyperkeratosis of the palms and soles with a tendency to fissuring. The nails were dull, rough, striated and brittle. In other cases the lesions had a tendency to become verrucous or nodular and were usually located on the lower extremities. They were most frequently diagnosed as hypertrophic lichen planus. The classical lichen planus papule with Wickhams striae was rarely seen.

The lesions might extend rapidly or progress slowly with new lesions appearing on other parts of the body but the upper back was usually spared. The lesions of the eyelids at the time I observed them were slate colored infiltration of the lower or upper or both eyelids.

The buccal mucous membrane lesions were either leukoplakia-like or resembled the lacy configuration of lichen planus. An atrophic area in the mid dorsal area of the tongue has been observed by some. The lesions involving the vermillion border of the lips and the external genitalia are similar to those of lichen planus.

Captain Louis Goldberg¹ investigated the amount of gastric and rectal involvement. He stated that of twenty cases, three had involvement of the rectum. These occurred on the columns of Morgagni but never in the crypts. They were present 1 cm. or more above the anal cutaneous junction, but not in the sigmoid colon. No lesions were found in the stomach on gastroscopic examination. The rectal lesions disappeared after treatment.

One of the most striking characteristics of the disease was the pigmentation which accompanied it. Some of the plaques and pigmented area of the skin developed spotty hyper and depigmentations and a telangiectasias. In some, the pigmentation

* Read before the Section on Dermatology and Syphilology, at the Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

tion was a peculiar slate color. This pigmentation, in addition to the atrophies of various areas, the mottled alopecia of the scalp and other hairy parts, gave the patient a most unusual appearance. It is said that the atrophy and scarring has produced considerable permanent facial disfigurement of some cases.

Generalized exfoliation might occur following either the eczematoid or the lichenoid type or it might come primarily as an erythroderma. Occasionally it resulted from injudicious treatment. When it did occur the skin from the top of the head to the soles of the feet was weeping. The odor was foul. All lymph glands were greatly enlarged.

When exfoliation occurred in the lichenoid type, the pigmentation of the skin lessened. I observed one patient who exfoliated several times, and whose pigmentation became less with each exfoliation.

At the time of my observations the constitutional symptoms were minimal. Easy fatigue and loss of weight were the most frequently observed.

SUMMARY

The clinical manifestations of dermatitis due to atabrine were varied, but for the most part can be classified as either eczematoid, lichenoid or exfoliative. One can merge into the others, or the manifestations of both can be present in the same individual. Healing is accompanied with spotty hyper or depigmentations, atrophies, slate colored infiltration, and a variable alopecia.

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Atabrine Dermatitis and Associated Aplastic Anemia*

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PART I—ATABRINE DERMATITIS

AS early as 1943, a large number of patients with skin eruptions resembling and at first diagnosed as lichen planus, began to appear among the service men and others connected more or less directly with the war effort. The disabling nature of this disease with its unusual manifestations attracted the attention of many dermatologists.

In this paper, not all phases of this disease will be covered, but a brief description of the cutaneous lesions which were observed for the most part at Letterman General Hospital in San Francisco will be presented. This hospital received the majority of the dermatological cases being evacuated to the United States from the Southwest Pacific area. Therefore, hundreds of cases were seen. Most of these patients were observed for short periods because they were soon distributed to inland hospitals nearer their homes. For this reason most of the cases were observed during the early and active phases of the disease. There have been comprehensive studies by other workers regarding the etiology of these cutaneous lesions; reports of some of these studies are not yet published. At present it is generally accepted that atabrine is the chief etiologic factor. The cutaneous reactions to atabrine may be divided into three groups: (1) the lichenoid, which is the type primarily to be considered in this report. (2) the eczematoid, and (3) the generalized exudative and exfoliative type.

Lichenoid: This reaction was manifested chiefly by the appearance of pigmented, round or oval, elevated hyperkeratotic and verrucous lesions 0.5-1.5 cm. in diameter, and often by violaceous plaques attaining several centimeters in size. These occurred predominantly on the extremities, usually with the heaviest involvement on the legs, giving the appearance of hypertrophic lichen planus. Often they were concentrated on the buttocks and pubic areas. Although the sides of the neck and thorax were commonly involved, lesions on the upper portions of the body were generally less hypertrophic than those on the lower extremities. The face was commonly affected with pigmentation and thin scaling of the eyelids, especially the upper lids. On the scalp, a follicular hyperkeratotic process resulting in alopecia often occurred. Total alopecia of the scalp has been followed by a patchy regrowth in many cases. The eyebrows, especially the lateral halves, may likewise be affected. About 30 per cent of the cases have mucous membrane lesions of the lips, tongue, buccal mucosa, or palate. The onset of the mucosal disease was usually marked by discomfort and finally resulted in white, silvery or gray areas simulating lichen planus. Certain light complexioned individuals had erythematous lesions with extensive follicular spine formation. These were found about the shoulders, thorax, and outer surfaces of the thighs, and have been noted to coexist with the verrucous type already described. This form healed with atrophy, and not uncommonly with areas of anhidrosis. Subsiding lupus erythematosus may enter into the differential diagnosis of this form.

Eczematoid: The eczematoid type may simu-

* Read before the Section on Dermatology and Syphilology, at the Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

late an extensive eczematoid dermatitis, nummular eczema, or fungus infection. Indeed, differentiation from generalized contact dermatitis resulting from jungle vegetation has at times been difficult. Distribution of lesions on the feet, ankles, legs, wrists, forearms, sides of the neck, pinnae, and scalp was fairly constant. The trunk likewise often presented well-margined patches which were strongly suggestive of a fungus infection. A weeping dermatitis was commonly found in the groins and the bearded area. The entire eczematoid process may vary from the acute exudative to the chronic erythemasquamous stage.

The history of many of the lichenoid cases revealed that the lichenoid phase was preceded by this patchy eczematoid type. I have seen the transition occur, and have personal reports from other observers confirming it. The existence of both types concurrently was frequently seen.

Generalized Exudative and Exfoliative Type: This reaction was seen less frequently than the two preceding types. Cases in which the exudative phase predominated were often difficult to separate from those with a severe and extensive eczematoid type. Some patients with the exudative and exfoliative type were moderately to seriously ill, with a reduction of total serum proteins, a bacteremia, and a septic course.

All three types of cases showed weight loss from 10 to 40 pounds, being most pronounced in the extensive eczematoid and exfoliative groups. A number of deaths have occurred in patients with these cutaneous reactions, and a discussion of some of these will form the second part of this paper.

Most individuals with these reactions showed some evidence of photosensitivity, particularly those with the lichenoid type. There was frequently a diffuse slate-like pigmentation of the face and dorsa of the hands as well as of the lips.

Etiology: The etiology of these peculiar cutaneous reactions has been the subject of considerable speculation and discussion, particularly among military dermatologists, for the past three years. Obviously the incidence of these reactions has been higher in men, but a number of cases have been seen among members of the Army Nurse Corps and in female Red Cross personnel.

Careful histories revealed that most of the patients first sustained some type of injury to the skin, such as abrasions with secondary infection, insect bites or contact dermatitis. As these conditions healed, the so-called lichenoid or eczematoid reaction became superimposed upon them.

Geographically, New Guinea was the most important island from the standpoint of incidence of these reactions, although many occurred in other islands of the Southwest Pacific Area. The condition was not limited, as was first thought by some observers, to the Southwest Pacific area. We saw six cases of the mild lichenoid type in patients from North Africa and Sicily. In noting the ages of 65 consecutive patients admitted with the lichenoid type, it is interesting that 45 were in

the early fourth decade of life. This is notable in that this age is definitely above the average for the men who were in the Southwest Pacific Area at large.

In the group of patients with the lichenoid type which were studied, the average period of service in the Southwest Pacific area at the time of onset was 5.9 months, exclusive of service in Australia.

Probably the most important single etiological factor to be considered is atabrine. To the best of my knowledge, Nisbet first suspected and reported atabrine as the prime etiological factor. It can be stated conservatively at this time that there is much circumstantial evidence pointing to the prolonged prophylactic use of atabrine as the cause of the cutaneous reactions described above. Several workers are reporting original work which will quite conclusively demonstrate the role of atabrine in this clinical entity.

The incidence of these reactions in the Army and Navy was low. Without atabrine, the war effort in the Southwest Pacific area would have been very seriously handicapped.

Pathology: In the lichenoid lesions in the hypertrophic stage, the surface is moderately to extremely verrucous. There appears marked thickening of the epiderm with elongation of the interpapillary processes, varying degrees of hyperkeratosis, and a prominent granular layer. Zones of parakeratosis are seen in some sections with corresponding loss of the granular layer. The rete pegs are often of an acuminate shape, resembling those found in lichen planus. Perinuclear vacuolization and a disturbed basement membrane are usually seen, together with intercellular edema. In the dermis there appear varying degrees of collagenous degeneration and destruction resulting in a loose arrangement of connective tissue fibers. Within the meshes of these fibers are infiltrating cells, mostly lymphocytes, together with varying numbers of endothelial cells. These changes are found chiefly in the papillary and subpapillary levels, where considerable vascular dilatation is also seen. In most cases pigment is found both intra and extracellularly throughout the upper dermis. As healing progresses, there is a marked reduction in hyperkeratosis, a thinning of the epiderm with shortening of the interpapillary processes, reduction of the inflammatory reaction, and, frequently, varying degrees of atrophy. Atrophic changes occur also in the arrectores pilorum muscles and in the sudoriparous glands. A perivascular infiltrate is seen forming strands, some of which extend into the deeper levels of the dermis.

An insufficient number of sections from late healed cases have been studied to describe the ultimate picture. Some sections are apparently indistinguishable from those of lichen planus. Sections from the eczematoid group are very similar to eczema with the usual findings indicative of inflammation and weeping. It is noticeable, however, that many sections reveal club-shaped rete pegs, suggestive in this respect of psoriasis.

Treatment: General supportive treatment including good diet and often supplementary vitamin intake, together with cessation of atabrine administration, is indicated. The eczematoïd and exfoliative types are treated along generally accepted lines. It should be emphasized, however, that all local therapy must be very bland, as these cases do not well tolerate stimulation. In the exudative cases, Burow's (1-16) or boric acid solution compresses or starch baths are very helpful. During the interval between compresses or baths, dressings of bland creams or ointments are often necessary, although these may occasionally aggravate some cases. Lubrication with cocoa butter is usually indicated for the subsiding dry erythemato-squamous stage.

Attempts to use heavy metal therapy in the lichenoid type have proven unsatisfactory. The results of arsenical preparations such as Fowler's solution were likewise disappointing. X-ray therapy, except in a few localized, very hypertrophic lesions, was unsatisfactory and is not recommended.

Although the average case subsided within two to three months after returning to the United States and discontinuing the use of atabrine, many are subject to relapse, particularly those of the eczematoïd type.

PART II—APLASTIC ANEMIA

Aplastic anemia was the most common cause of death in patients with skin lesions due to atabrine. Of nine cases with atabrine dermatitis coming to autopsy over a period of a year and a half, seven had aplastic anemia. In the other two cases, pyoderma with sepsis and acute yellow atrophy of the liver were the causes of death.

TABLE 1.

Case	Skin Lesions	Aplastic Anemia	Acute Yellow Atrophy of Liver
A-2367	O	X	O
A-2374	O	X	O
A-2413	X	X	O
A-2415	X	X	O
A-2463	X	X	O
A-2482	X	X	O
A-2484	X	X	O*
A-2513	X	X	O
S-20892-A	X	X	X
C-21063-A	X	O	X
A-2408**	X	O	O
A-2468	O	O	X
A-2470	O	O	X
A-2490	O	O	X
A-2508	O	O	X
A-2515	O	O	X

* Small infarcts of liver.

** Developed pyoderma and died from sepsis.

During the same period there were nine cases of aplastic anemia, and of these only two did not have atabrine dermatitis. In contrast to the close association between atabrine dermatitis and aplastic anemia, acute yellow atrophy of the liver did not occur with any great frequency in patients with atabrine dermatitis or aplastic anemia. Of eight cases with acute yellow atrophy, two occurred in patients with atabrine dermatitis; one of these two also had aplastic anemia.

The presenting complaints in five of seven patients with both skin lesions and aplastic anemia were those due to dermatitis. The anemia in these cases was discovered on routine blood counts. However, the histories in these cases revealed that the patients had noticed weakness, fatigue, dyspnea on exertion, and bruising or hemorrhages for some time prior to entry into the hospital. Several of the patients had had dermatitis for as long as six months before entering the hospital. The hematologic findings in this group of cases were characteristic of aplastic anemia.

The anemia was marked in nearly all of these cases and was usually of the normocytic normochromic type; there was slight macrocytosis in some cases. Reticulocytes were decreased. The total leukocyte count averaged less than five thousand per cubic millimeter. In one case the white blood cell count dropped to less than a thousand per cubic millimeter. The leukopenia was characterized by a decrease in the number of granulocytes with a shift of the Arneth index to the right. Blood platelets also showed diminution in number in most of the cases in which this determination was made.

All of these patients rapidly pursued a downhill course. Terminally most of them developed extensive hemorrhages and sepsis. Autopsy findings confirmed the clinical diagnosis of aplastic anemia.

Bone marrow in these cases showed some variation. In most cases there was more or less complete aplasia with loss of almost all myeloid and erythroid cells and megalokaryocytes. Small groups of lymphocytes and plasma cells were present. There were occasional macrophages containing phagocytized blood pigment. In some cases the bone marrow showed areas of hyperplasia with extensive areas of necrosis containing degenerated myeloid elements, fibrin, macrophages, plasma cells and lymphocytes.

SUMMARY AND CONCLUSIONS

1. Three types of cutaneous reactions to atabrine have been described clinically and histologically; namely, the lichenoid, eczematoïd, and generalized exudative and exfoliative types.

2. Treatment was briefly discussed. Cessation of administration of atabrine, general supportive care and dermatologic care along accepted lines were recommended. X-ray therapy was of no benefit except in a few cases of the hypertrophic type. The use of heavy metals and arsenic was not recommended.

3. Aplastic anemia was found to be the most common cause of death in patients with atabrine dermatitis.

4. In our cases there was no definite relationship of acute yellow atrophy of the liver either to atabrine dermatitis or aplastic anemia.

5. The frequent occurrence of aplastic anemia as the cause of death in patients with atabrine dermatitis suggests that there may be a common etiologic background.

Untoward Effects of Atabrine*

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DURING the late war it was my privilege to see many patients who were receiving or had received atabrine therapy. By most, it was well tolerated, the only untoward sign being the yellow color imparted by the dye to the skin. By a few it was not tolerated, and it is of the various manifestations produced by the drug in this latter group that we wish to speak.

Atabrine has been said to produce fewer toxic symptoms than quinine. With this we disagree. Vomiting occurred as frequently as it does in quinine therapy but was usually of shorter duration. Nausea lasted longer. Some patients complained bitterly of "nervousness," a symptom not common with quinine.

About five patients per thousand became psychotic, but all we saw recovered. There were two types seen: one, insidious in onset, usually occurred about a week after the cessation of the therapy, and was accompanied by disorientation, gradual clouding of the sensorium, sluggishness

and inactivity, and the loss of memory for recent events; the other type showed markedly increased motor and psychomotor activity, frequently requiring sedation, and occasionally physical restraint. Visual and auditory delusions and hallucinations were common.

The skin manifestations were interesting and variable. Urticaria and exfoliative dermatitis occurred, the former usually transitory.

More spectacular were those cases which resembled lichen planus and were so labeled by many dermatologists, though the atabrine source of these cases was early recognized.

From the Caribbean and South Atlantic theater, cases were admitted to the hospital that greatly resembled lupus erythematosus disseminatus. These cases were proven by therapeutic tests in some instances, but not in all, to be due to atabrine. An interesting observation about these cases was their photosensitivity. After cases had cleared up during hospitalization, exposure to sunlight to a degree not previously harmful would again produce the lesions though no atabrine had again been used.

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ALLERGY DRUG PRESENTS SERIOUS INDUSTRIAL HAZARD—DROWSINESS

Two Rochester, N. Y., doctors warn that benadryl, a very effective drug for allergic skin diseases, is dangerous to persons operating any kind of machine, especially an automobile, because it may produce drowsiness, according to an article in the September 28 issue of *The Journal of the American Medical Association*.

Benjamin J. Slater, Associate Medical Director, Eastman Kodak Co., and Nathan Francis, of the Medical Department of the Eastman Kodak Co., in Rochester, state that "because of this narcotic side reaction incident to the taking of benadryl, the drug may be a serious hazard when used by persons operating automobiles or in industry operating moving equipment or machinery."

In their series of 65 cases, the authors point out that drowsiness was a common symptom in 25. "This figure

should be increased somewhat," they say, "as many of our patients were instructed to take the drug only at bedtime. Invariably they reported that they slept better than usual. Drowsiness may occur from one to three hours after taking benadryl, and this drowsiness may be cumulative if the drug is continued."

A case report of one of their patients serves to illustrate how dangerous the effect of the drug may prove. A 20-year-old man was given a 50 milligram capsule of this drug to relieve severe symptoms of hay fever. The second day of treatment he took the capsule just before going to work. He complained of feeling drowsy. An hour later, while driving an electric platform cargo truck, he lost control of the truck and it fell off the platform. Fortunately, he jumped in time to avoid injury.



Observations on the Function of the Clavicle*†

VERNE T. INMAN, M.D., PH.D., AND J. B. DEC. M. SAUNDERS, F.R.C.S. (Ed.), *San Francisco*

THE function of the clavicle is usually dismissed with the observation that it acts as a sort of flexible outrigger which serves as a prop for the shoulder, thus establishing the conditions necessary for free action of the arm. But such a statement is far too general and provides little understanding of the essential mechanism to enable us to interpret certain clinical derangements or to develop rational methods of surgical correction.

The shoulder itself constitutes a complex mechanism in which no less than three joints participate, the sternoclavicular, the acromioclavicular, and glenohumeral, as well as the accessory motion of the scapula on the thoracic cage. So intimately related and yet so diverse are these individual functions that it is impossible to treat one of the constituents of the shoulder without at least touching upon the mechanism of the others. Therefore, in considering the function of

the clavicle and in discussing such clinical problems as arise in association with dysfunction of this single member, it becomes necessary to touch, however briefly, on the range of movement occurring at the shoulder joint proper, so that we may follow some aspects of its sequence of motion in relationship to the other constituent bony levers.

The several joints which make up the shoulder complex, although capable of independent motion, all contribute their share to the total movement in a simultaneous but not successive manner. It is this simultaneity which results in that harmony of movement which Codman has so aptly called scapulo-humeral rhythm. It is of great clinical importance to recognize that any break in this harmony of rhythm is positive evidence of derangement in one or the other of the several components of the shoulder mechanism.

The most important movement for analysis is elevation of the arm, whether it be attained either through abduction or forward flexion. In these pathways there is little essential difference in mechanism except for minor details.

Elevation of the extremity, both in flexion and in abduction, at the glenohumeral articulation is simultaneously accompanied by scapulothoracic movement, an arrangement which critically en-

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CLAVICULAR ANGLE

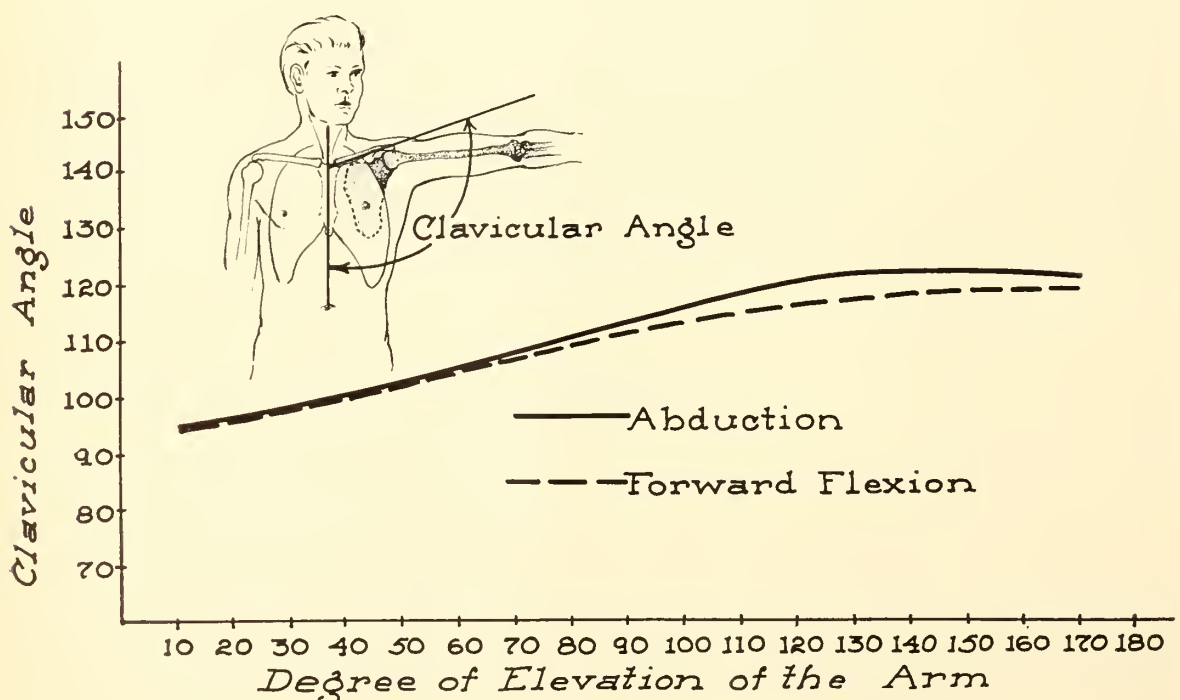


Figure 1.

SPINO-CLAVICULAR ANGLE IN THE CARONAL PLANE

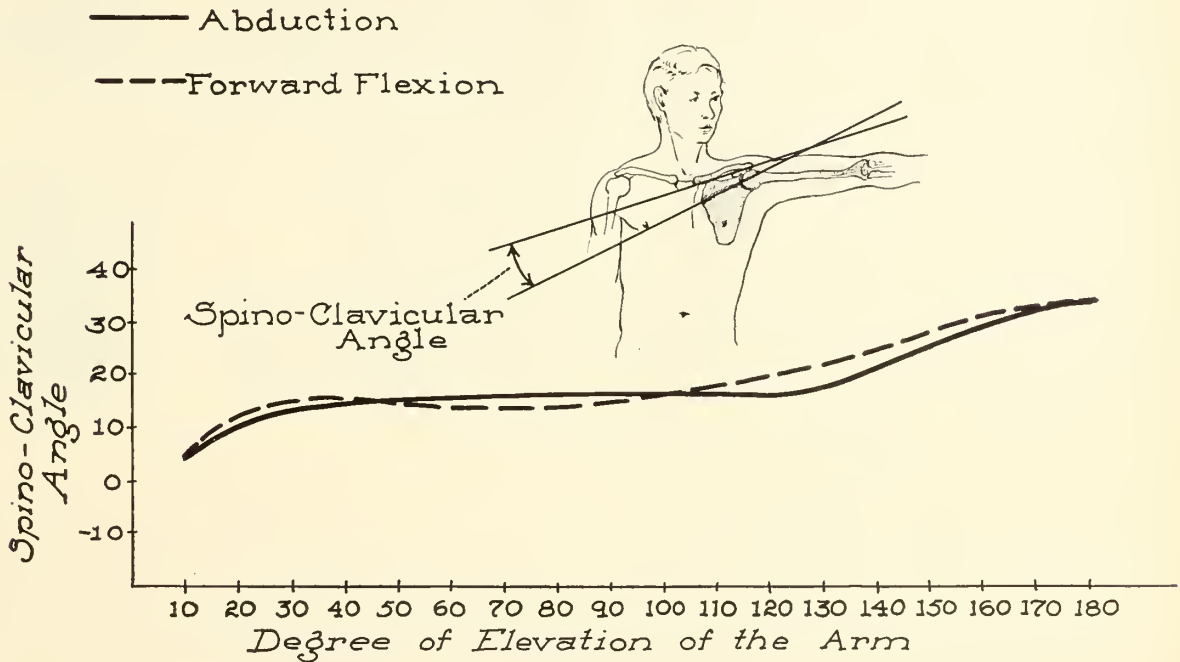


Figure 2.

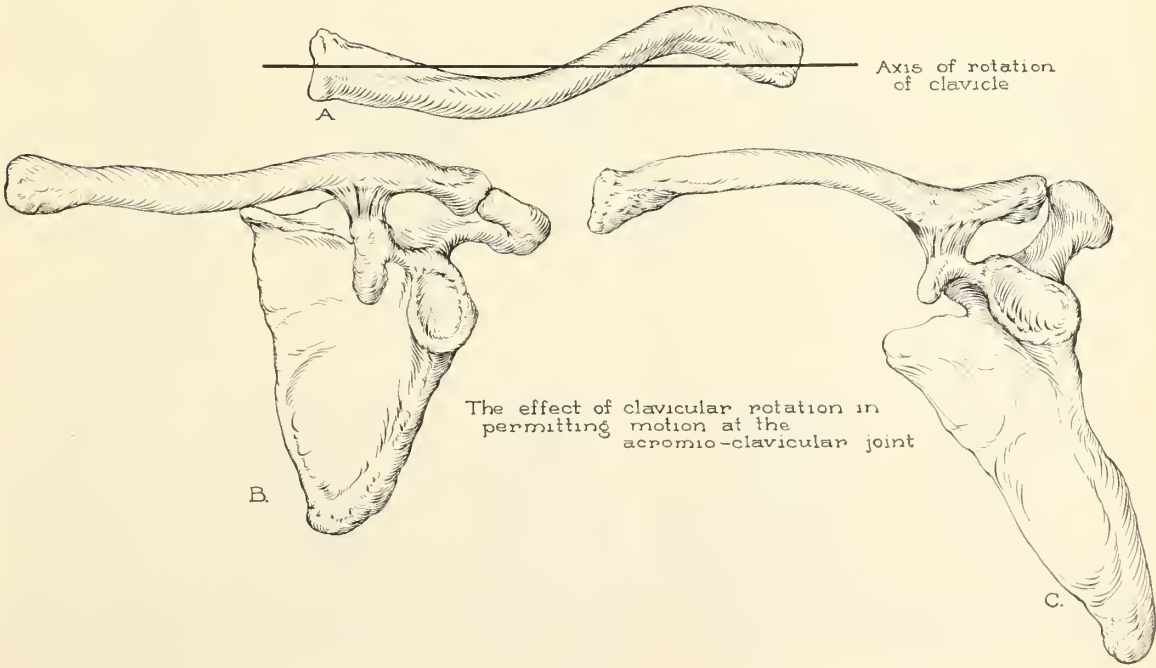


Figure 3.

hances the power of the attendant muscles. In the first 30 to 60 degrees of elevation, the scapula seeks, in relationship to the humerus, a precise position of stability, which it may obtain in one of several ways. Either the scapula remains fixed, motion occurring at the glenohumeral joint until the stable position is reached, or the scapula moves laterally or medially on the chest wall, or in rare instances oscillates until stabilization is attained. Hence the early phase of motion is highly irregular, and is characteristic for each individual. It would seem to depend upon the habitual position which the scapula occupies in the subject when at rest. This phase of motion is related to the

setting action of the muscles, and we have, therefore, termed it "the setting phase."

Once 30 degrees of abduction, or 60 degrees of forward flexion has been reached, the relationship of scapular to humeral motion remains remarkably constant. Thereafter a ratio of two of humeral to one of scapular motion obtains; and thus, between 30 and 170 degrees of elevation, for every 15 degrees of motion, 10 degrees occurs at the glenohumeral joint, and 5 degrees by rotation of the scapula on the thorax.

Roentgenograph and examination of the living prove beyond a doubt that scapular and humeral motion are simultaneously continuous. As this

ROTATION OF THE CLAVICLE AROUND ITS LONG AXIS

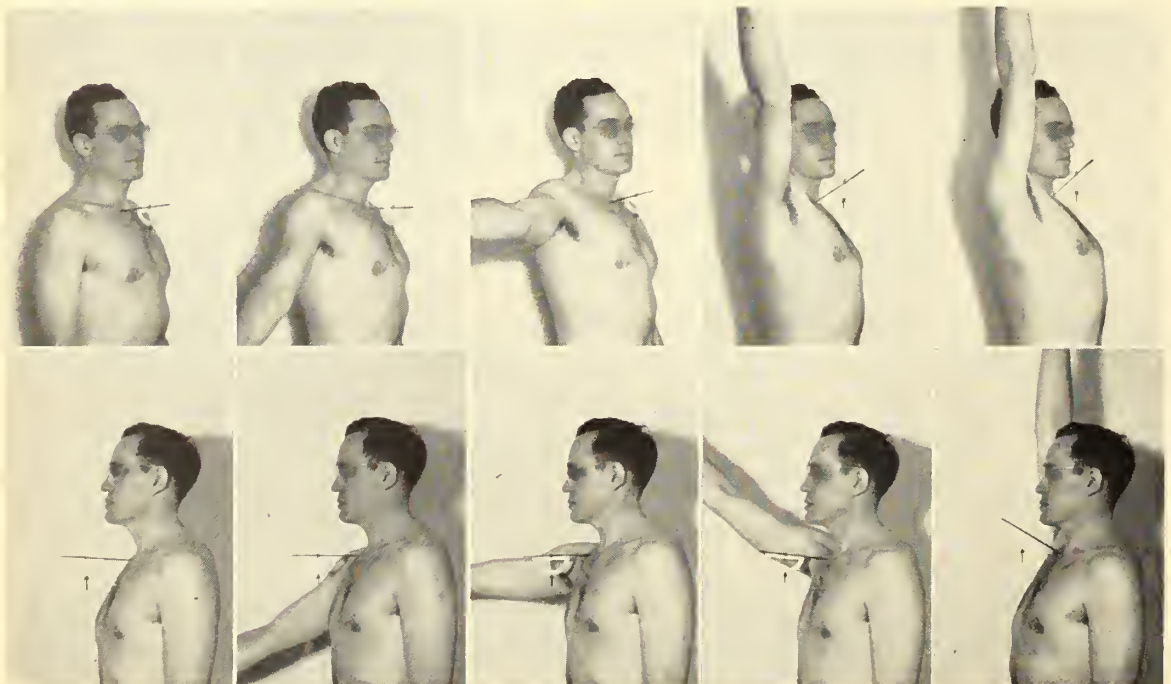
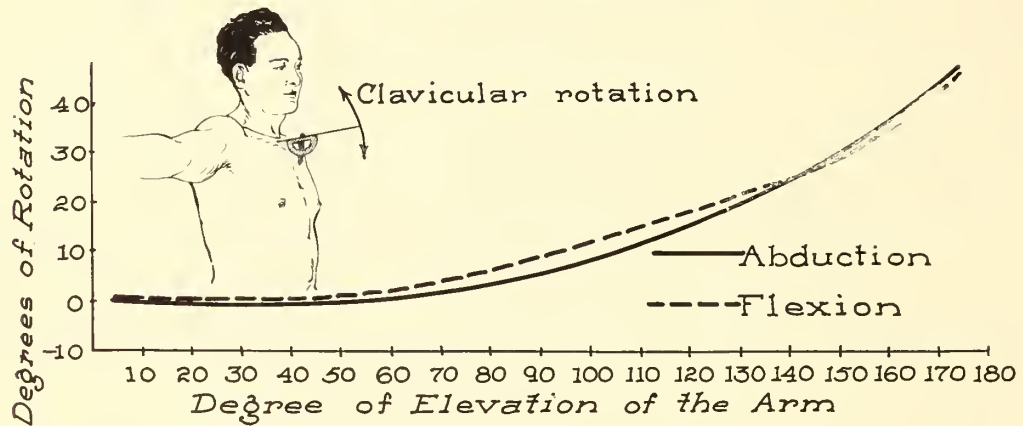


Figure 4.



Figure 5.

ratio pertains, it is evident that the total range of scapular motion is not more than 60 degrees, nor that of the glenohumeral joint greater than 120 degrees. Under special and abnormal conditions, the motions of either one of these two joints can occur independently. For example, when the scapula is fixed, it is possible to raise the arm actively to the right angle and passively to 120 degrees.

Clavicular motion is more complicated than has been hitherto suspected. The continuous rotation of the scapula on the thoracic wall during elevation of the extremity is only possible because of the motion permitted at the two clavicular joints, and the phase and amount of movement is unequally distributed between them.

Elevation of the arm is accompanied by elevation of the clavicle at the sternoclavicular joint (Fig. 1). This movement begins early and is almost complete during the first 90 degrees, when for every 10 degrees of elevation of the arm, there are four degrees of elevation of the clavicle. Above 90 degrees, clavicular motion at this joint is almost negligible.

Motion at the acromioclavicular joint contrasts markedly with that found at the sternoclavicular joint (Fig. 2). The total range is approximately 30 degrees and occurs both early, in the first 30 degrees of abduction, and late, after 135 degrees of elevation of the arm. Between these two points there is almost no motion of this joint.

The sum of the movements at the sternoclavicular and acromio-clavicular joints is naturally equal to the range of movement permitted the scapula. Anatomically it is possible to envisage an adequate range of movement occurring at the sternoclavicular joint but it is difficult to understand how motion of such extent could occur at the acromioclavicular joint, in view of the fact that the clavicle is rigidly attached at its lateral extremity to the

scapula through the medium of the coracoclavicular ligaments. For motion to occur at the acromioclavicular joint in the plane of elevation of the arm, elongation of this ligament would appear to be necessary, and on first sight this would seem to be impossible. Because of the marked curvature of the outer third of the clavicle, we could envisage a relative elongation of the coracoclavicular ligament, only by the clavicle rotating on its long axis, so as to allow this curvature to act as a crankshaft (Fig. 3).

The existence of such clavicular rotation about its long axis was demonstrated experimentally in the living subject by the insertion of a steel pin into the bone and the measurement of its range of motion with elevation of the extremity. The degree of rotation proved to be very appreciable and amounted on the average to a movement of 50 degrees. (Fig. 4.) How necessary this rotation is for the free elevation of the extremity was shown experimentally by manual interference of the movement through the medium of the pin inserted into the clavicle. Under these conditions elevation is promptly limited to about 120 degrees (Fig. 5). The clinical significance of these findings will be discussed later.

The effect of clavicular rotation on the coracoclavicular ligaments is established by anatomical dissections. A direct relationship is found to exist between the line of attachment (trapezoid line and conoid tubercle) of these ligaments, the amount of clavicular rotation, the extent of relative lengthening of the ligaments and furtherance of scapular rotation. (Fig. 6.) Thus, of the total 60 degrees of scapular rotation, the first 30 are due to the elevation of the clavicle as a whole by movement at the sternoclavicular joint and the second 30 degrees permitted at the acromioclavicular joint by clavicular rotation and relative elongation of the coracoclavicular ligaments. Therefore, the lateral curvature of the clavicle is of the greatest

significance. It permits the clavicle to act as a crankshaft and thus mechanically allows of no less than half of the scapular movement.

In protrusion and retraction of the shoulders, no appreciable motion occurs at the acromioclavicular joint (Fig. 7), nor is there any great rotation of the clavicle (Fig. 8), the movement occurring predominantly at the sternoclavicular joint.

These observations mutually clarify clinical

findings, and in turn are supported by them. The conception that the clavicle serves as a prop to the shoulder is not supported in those cases in which the bone is lacking or in which it has been excised. As is well known, the clavicle is absent or partially suppressed in that rare familiar disorder, craniocleido-dysostosis. In these cases the disposition of the shoulders in the resting position is not markedly disturbed, but their range of motion is greatly enhanced, protrusion and retraction

ACROMIO-CLAVICULAR MOTION IN CORONAL PLANE

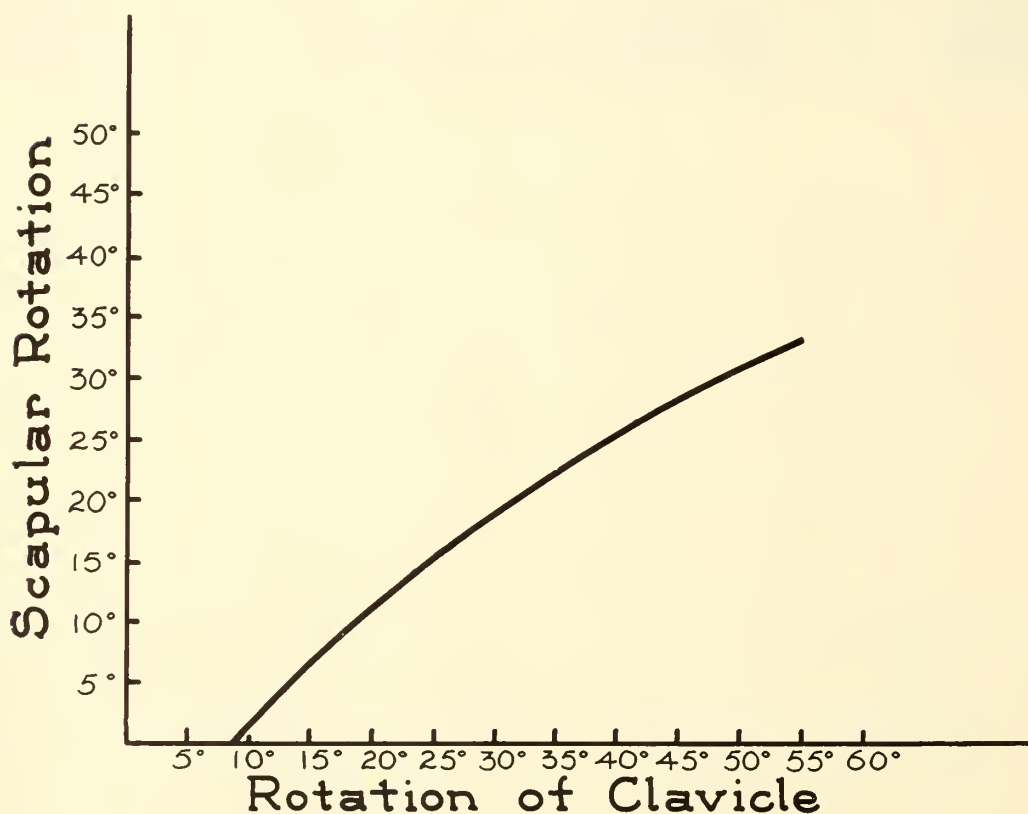


Figure 6.—Dissection of pectoral girdle mounted to demonstrate motion at the acromioclavicular joint. Goni-

meters are attached to scapula and clavicle to indicate simultaneous angular changes for construction of graph.



Figure 7.—Subject viewed from above. Pins inserted into acromion and lateral extremity of the clavicle. Note that there is little change in the angle between the pins during protrusion and retraction of the shoulders.

of the shoulder becoming very extensive and elevation being increased to beyond 180 degrees. (Figs. 9 and 10.) The lack of disability at the shoulder observed in this disorder has given us confidence in recommending excision of the clavicle in the presence of tumors and osteomyelitis of this bone. We have excised the entire clavicle in four patients. Diagnosis was a large expanding giant cell tumor, metastatic carcinoma of thyroid, Ewing's sarcoma and chronic osteomyelitis. The functional disturbance was negligible. The shoulder did not drop inwards and forwards as might be anticipated. The range of motion was increased and minor instability only occurred when a weight was supported over the head. On measurements there was no loss of muscle power and no complaint of dragging sensations in the arm. (Fig. 11 and Fig. 12.) These cases effectively dispose of the conception that the clavicle acts as a prop, but suggest that it contributes somewhat to stability in supreme elevation. Furthermore, our experience would lead us to recommend excision of the clavicle as an effective method of gaining an increase in the range of motion in arthrodesis of the glenohumeral joint.

As pointed out, clavicular rotation permits the final half of scapular rotation. With loss of this motion, abduction is limited to approximately 120 degrees. We have been able to demonstrate on several occasions the effects of this loss in the recently advocated method of treatment of acromioclavicular dislocation in which the clavicle is fixed to the coracoid by means of a metal screw, or in which the acromioclavicular joint is stabilized by the insertion of a metal pin. A single example will suffice to illustrate the unsatisfactory features of these methods of treatment.

CASE HISTORY

A 20-year-old student suffered an acute acromioclavicular dislocation of the right shoulder while playing football in September, 1943. Five days later the dislocation was reduced surgically and fixation achieved by the insertion of a metal screw through a drill hole in the clavicle into the base of the coracoid. (Fig. 13.) Following recovery from surgery the patient discovered that he was unable to elevate that arm above 110 degrees although no discomfort was felt. (Fig. 14.)



Figure 8.



Figure 9.

In January, 1944, while running, he slipped and fell, forcibly abducting the arm above his head. Over the tip of the shoulder he suffered immediate pain which subsided rapidly. Following this he found that he had regained a complete range of motion. X-rays revealed that the screw had been bent and avulsed from the coracoid, permitting the clavicle again to rotate freely. (Fig. 15.)

In the surgical treatment of acromioclavicular dislocation where, apart from conservative methods, it is desirable to maintain the full range of active motion, one has a choice of restoring the torn acromioclavicular ligaments or excising the lateral half of the clavicle. If the procedure of resection is adopted the clavicle should be removed to a point medial to the attachment of the liga-

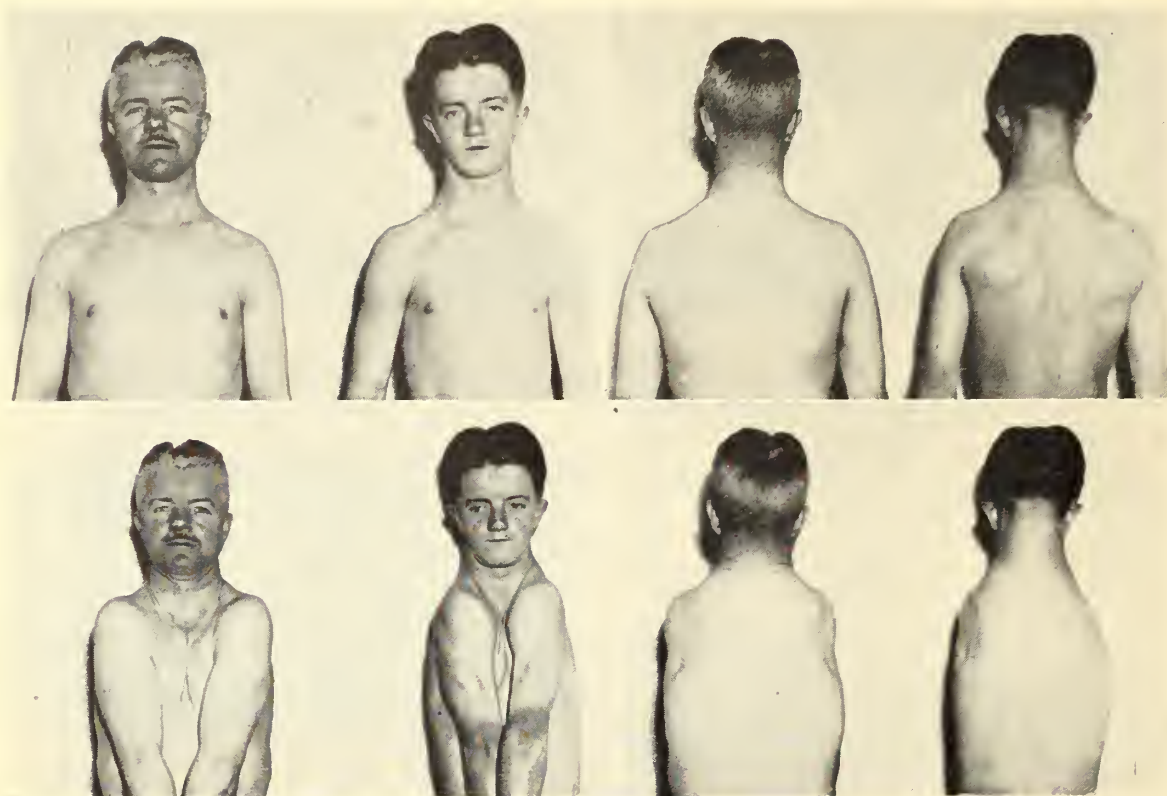


Figure 10.

ments. Otherwise, tension is still transmitted by these injured structures and pain will persist. If ligamentous restoration by fascia is chosen, it is important to insure that the clavicular attachment be placed as near as possible to the apex of the lateral curve of the clavicle. The unsatisfactory results from fascial reconstruction are often due to neglect of this point. Because of the cranklike action of the bone, it is necessary that the fascial suture follow, as closely as possible, the course of the normal ligaments. Otherwise there will be some limitation of movement and excessive stress thrown upon the repair.

Dysfunction at the shoulder sometimes occurs in association with fractures of the clavicle. Fortunately these complications are not common. An excessive exaggeration of the outer curve may interfere with the axis of clavicular rotation, resulting in displacement of its sternal extremity and pain at the related joint. We have recently seen examples of this type.

CASE HISTORY: CASE II

At the age of nine years the patient fell and fractured the right clavicle at the junction of the middle and inner thirds. The fracture was immobilized in a figure "8" of plaster. Healing occurred rapidly but with an increase in the medial curve and suppression of the lateral curve. No disability was experienced until several years later when increasing discomfort was noted at the sternoclavicular joint. When examined nine years after the original injury there was swelling over the right sternoclavicular

joint. The right clavicle was more prominent than the left with a definite increase in its medial curve. There was marked instability of the right sternoclavicular joint as compared with the left. On elevation of the right arm the sternal end of the clavicle described an arc instead of rotating through an axis passing through the center of the articular surface of the joint.

Loss of the lateral curvature of the clavicle on the other hand immediately prohibits the full range of scapular rotation and interferes with complete elevation. The decrease in elevation is directly proportional to the degree of obliteration of this curve and is only noticeable above 120 degrees.

From these observations it is clear that apart from serving as a link in the pectoral girdle, the fundamental and most important function of the clavicle is related to the existence of its curvatures. It is these curves, especially the lateral, which bring this bone into relationship with the scapula and indeed are responsible for the necessary freedom which the scapula must possess to provide the niceties of rhythm which are so characteristic of shoulder movement. All other aspects of clavicular function are subsidiary to its rotation. Consequently, any condition which results in interference with this motion, or changes its relationship to other components of the complex, will result in limitation of movement. It can be said that the presence of the clavicle is not entirely necessary in man, and its absence in no way restricts, but in fact increases, the range of shoulder

movement with but slight loss in stability. Nature in her endless experiments has in many forms entirely suppressed this structure.

SUMMARY

- 1. The function of the clavicle is closely integrated with the shoulder complex and any restriction of motion at either of its joints is promptly reflected in the total range of motion at the shoulder.
- 2. The traditional conception as it serves as a prop is of little or no consequence, and excision of the bone leaves no significant disability. It serves, however, to give some stability to the extremity under load in the extreme ranges of motion.
- 3. Rotation of the clavicle about its long axis and its action of its outer curve as a crankshaft is its most important function, since this motion allows of one-half the total range of rotatory excursion of the scapula. The remaining half of scapula excursion is the outcome of clavicular elevation at the sternoclavicular joint. Loss of clavicular rotation completely restricts elevation of the arm above 120 degrees which is a serious disability in certain occupations and athletic pursuits.



Figure 11.

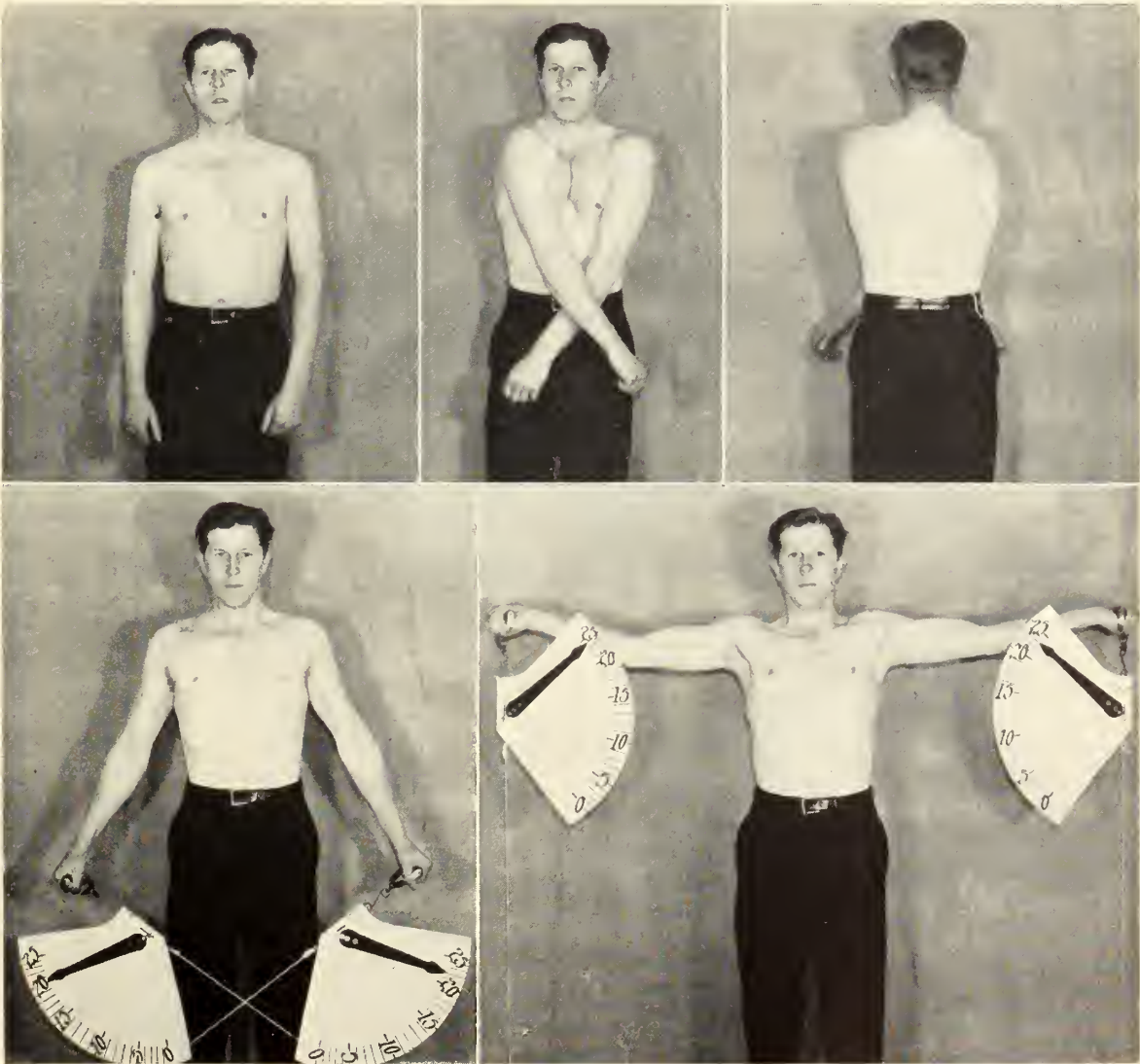


Figure 12.



Figure 13.



Figure 15.

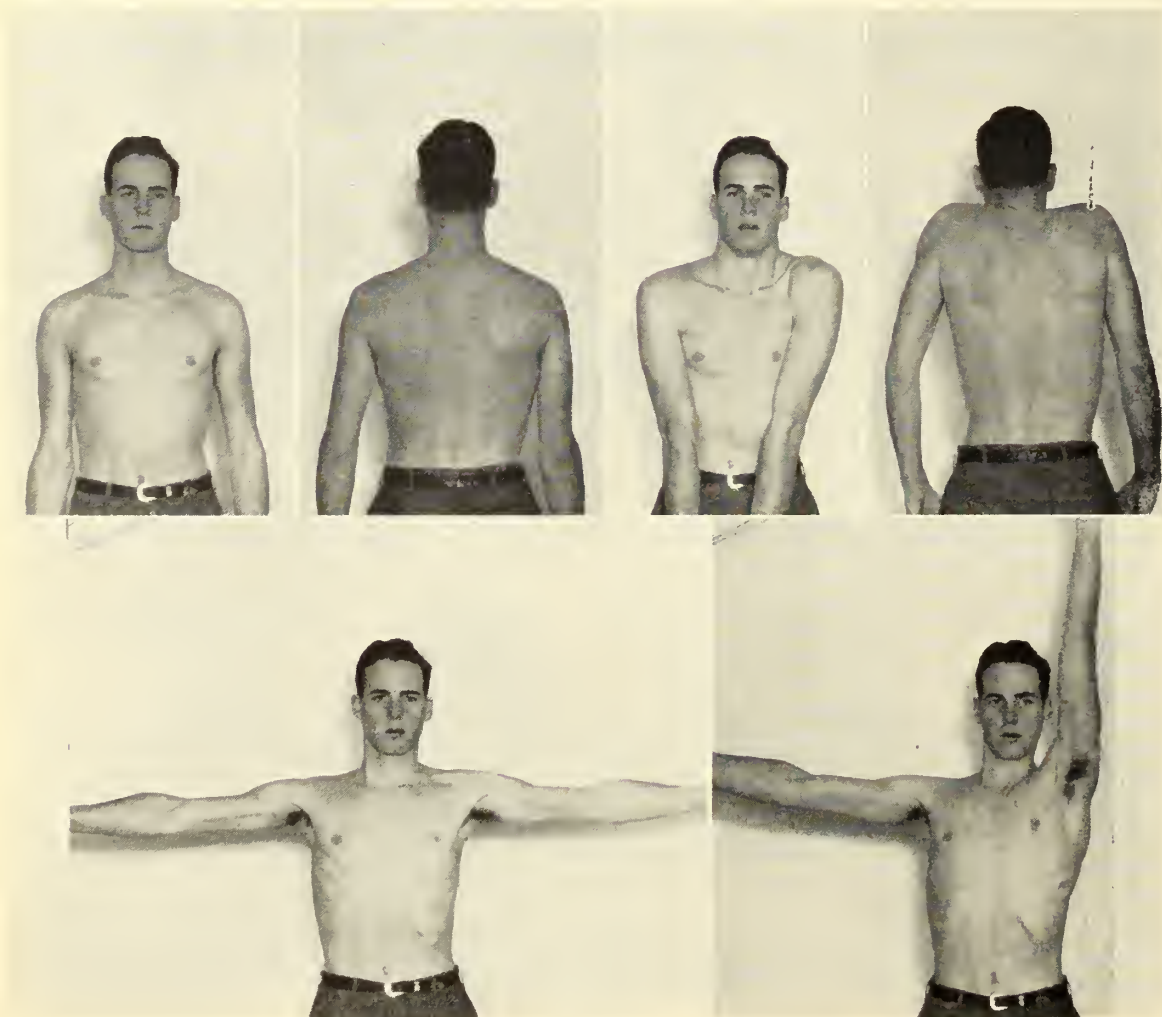


Figure 14.

Two Team Abdominoperineal Resection*

MALCOLM R. HILL, M.D., F.A.C.S., *Los Angeles*, AND ROBERT L. BELT, M.D., *Glendale*

WITH ever increasing interest in the surgical treatment of carcinoma of the rectum and rectosigmoid, there is still an apparent need of simplification of the operative procedure, even in the generally accepted Miles one stage resection.

It is the purpose of this presentation to evaluate the use of two operative teams in synchronous resection of the rectum and rectosigmoid through an abdominal and perineal approach using the Miles technique.

A review of the literature reveals that several writers in this field have given consideration to multiple simultaneous surgery in dealing with the treatment of cancer of the rectum and lower sigmoid. Bloodgood¹ in 1906, reported simultaneous surgery through an abdominal and sacral approach in attempting to completely remove carcinoma of the upper rectum and sigmoid colon with restoration of continuity. In 1934, Kirschner³ reports what he designates as a new operation, in which he uses a double operative team in a one stage abdominosacral resection. Trueblood⁶ one year later, gives as a preliminary report his use of two simultaneous operations in the combined abdominoperineal resection. Mention is made that he failed to find evidence in surgical literature that this procedure has been previously used. Lloyd-Davies⁵ recommends the use of a combination of Trendelenburg and lithotomy positions with proper leg and back support as a prerequisite in synchronous abdominoperineal resection and resection with anal anastomosis. Laufman and Bettman⁴ in presenting a modification of the Lloyd-Davies technique, make an appeal for a more widespread use of the combined procedure as a means of broadening the field of operability in the treatment of cancer of the rectum. Wangenstein⁷ mentions that his associate completed a closed anastomosis through a Fansler operating proctoscope while he continued the abdominal part of the surgery.

TECHNICAL FACTORS

After the administration of the spinal anesthetic, the patient is placed on the table (Figure 1) in the lithotomy position with the legs supported by right angle leg rests. A wide sand bag, four to five inches in thickness, is placed under the sacrum. The buttocks are placed three to five inches from the edge of the table. This allows optimum exposure of the ano-coccygeal and abdominal operative fields. Well padded shoulder

braces are used in maintaining the above position with Trendelenburg. One or both arms are placed above the head in a comfortable position which gives room for the surgeon and assistants. A left arm board may be used for intravenous therapy. In the male, the scrotum and catheter are held on the right thigh by means of a towel clip and adhesive. Continuous drainage of catheter may be maintained by connection to a floor basin. After surgical preparation, drapes are placed with minimal material in the pubic region. Instrument trays on stands can be placed over neck and legs. Lights are adjusted for each field of operation.

Exposure for simultaneous two team resection is made through a midline abdominal and a racket shaped peri-anal incision. The anus is closed by preliminary subcuticular linen ligation. During the first phase of the abdominal operative procedure the inferior mesenteric artery and vein are severed between clamps and ligated. After freeing the terminal bowel from both perineal and pelvic attachments the sigmoid colon is severed with cautery between de Martel clamps. The lower segment containing the neoplastic disease is then delivered by the perineal operator. The abdominal peritoneal floor is reconstructed and supported by packing from below into the pelvic wound using ten-yard roll of six-ply four-inch gauze which is kept from contact with any raw surface by an 18-inch square of rubber tissue. A permanent single barreled colostomy is placed in the midline abdominal incision which is closed about the colostomy, using interrupted figure of eight steel alloy suture to peritoneum and fascia, and skin clips. The colon is allowed to extrude three or more inches above the skin level to facili-

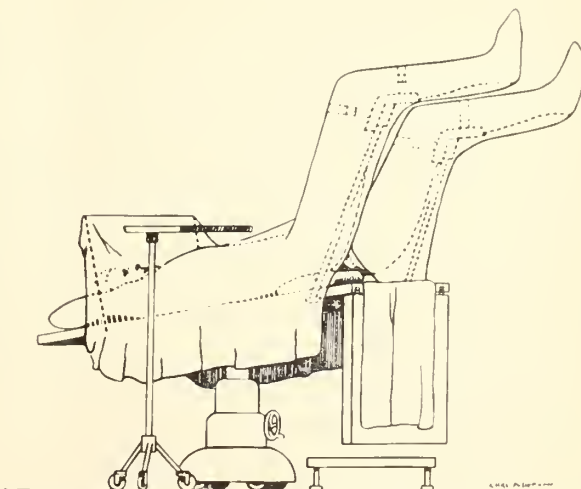


Figure 1.—Patient is placed in lithotomy position with Trendelenburg and complimentary elevation on sand bag under sacrum.

* Read before the Section on General Surgery at the Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

From the Department of Proctology, College of Medical Evangelists.

tate in the "Dudley Smith Method" of bed side colostomy care. Preliminary to dismissal of the patient from the hospital the redundant bowel is removed with cautery.

CLINICAL DATA

A series of 30 cases in which the diagnosis of carcinoma of the rectum had been previously made and verified by biopsy, are presented. These individuals were subjected to surgical removal of their lesions by two operative teams working simultaneously through an abdominal and perineal approach following, more or less, the Miles technique. The age group varied from 35 to 76 years, with the predominance of 60 and above. Sex was equally divided. Two of these patients had known of their condition at least one year and were considered as being probably inoperable. The grading of tumors on hospital entry varied from II to IV, with predominance of grade II. Postoperative stay in the uncomplicated cases varied from ten to sixteen days. All patients were adequately trained in the care of their colostomy prior to departure from the hospital.

ADVANTAGES OF OPERATION

Certain distinct advantages are apparent in two team resection. There is no need for change of position; this not only saves time, but minimizes shock. In our experience, this time saved as compared with the Miles multiple operative procedure averaged about one hour. This approach simplifies the operative technique in that it allows more choice in procedure and facilitates in the dissection of facial planes and attachments. This is readily illustrated in the perineal phase of the operation, in which the abdominal operator working out the cleavage planes between the prostate and rectum facilitates in the deep perineal dissection with less chance of injury to posterior urethra or rectum. Likewise, the retrorectal space can be more readily entered from below under guidance of a hand in the hollow of the sacrum. Synchronous operative procedure increases the operability of large adherent tumors which in many instances would be considered inoperable. The peritoneal pelvic floor is not only closed with more ease, but is supported with the proper amount of gauze packing placed from below into an 18-inch square of rubber tissue. Keeping the operative time between the one and two hour period holds it within the usual limits of one spinal anaesthetic. Supplementary or continuous spinal anaesthetics are seldom needed. All of these features encourage the use of this type of surgery in the elderly individual.

COMPLICATIONS

Complications arising during surgery were limited to ureteral injury and rupture of perforat-

ing bowel lesions. In two instances, the left ureter was involved. In one, some several inches of ureter had to be resected with tumor tissue. The severed ends were ligated to prevent urinary leakage. In the other case, a female, the left ureter was apparently injured in the dissection with subsequent urinary fistula into the pelvic wound. Before the patient left the hospital, the left kidney was removed. In two individuals, bowel leakage was observed in the abdominal phase of surgery, and in these peritoneal contamination was obviated by perineal operator being able to complete dissection from below; the peritoneal floor being closed over a soiled pelvic wound into which sulfa powder had been dusted.

Postoperative complications varied from urinary dysfunction, previously reported² by one of the authors, to ileus, pneumonia, pelvic abscess with cellulitis, and myocardial failure. One patient in this series suddenly expired ten minutes after return to her room. At no time during surgery was there any indication of shock. The operative time was limited to one hour. An autopsy revealed a coronary occlusion.

SUMMARY

1. Two team abdominoperineal resection has been carried out in a series of 30 cases.
2. Abdominal and perineal approach is made possible by use of a combination of lithotomy and Trendelenburg position with complimentary elevation of pelvis on sand bag placed under sacrum.
3. Synchronous operative resection of the rectum and rectosigmoid has several distinct advantages over the multiple stage abdominoperineal procedure using one operative team.

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The Responsibility of the Pediatrician In the Orthodontic Problem*

FRANCIS M. POTTENGER, JR., M.D., F.A.C.P., *Monrovia*

THE pediatrician has a large responsibility in preventing the development of an orthodontic problem in the growing child. It is he who can first observe in the infant the evidence of failure of development of the facial structures. When such failure is noted, the pediatrician can begin at once to institute measures to prevent or lessen future deformity which may require extensive oral correction. Although he cannot control the forces that developed the infant before birth, that being in large measure the internist's and obstetrician's responsibility, he can contribute a program of nutrition and care which will build strong, resistive oral structures with good alignment.

In this paper I shall discuss the leading post-natal influences which affect the growth and development of the facial structures and the teeth. The pediatrician who early takes roentgenograms of the head of the infant will be able to discover what density of bone is present, and what quality of supporting tissue. Subsequent x-rays of the head as the deciduous teeth appear will tell the pediatrician whether or not the anterior portion of the mandible will afford room for the permanent dentition. He can estimate the linear length of the bone supporting the deciduous teeth from second deciduous molar to second deciduous molar as the teeth emerge and determine from the breadth of the calcifying permanent teeth whether or not this portion of the jaw will be adequate.

Dr. Hays Nance,⁶ quoting from the work of John Hunter, states that this distance is determined by the end of the first year. In observing children in my own practice, I have felt that failure to expand the dental ridges and interdental bone of the anterior portion of the mandible by the third year omened permanent failure in this development. The pediatrician who discovers that the infant's jaw is failing to expand linearly by the last half of his first year is faced with the problem of that child's future tooth development, and his potential requirement of orthodontic assistance.

The linear difference between the space needed for the ten deciduous teeth, and the linear length of the alveolar and interdental bone needed for the ten permanent teeth replacing them, will determine, in a large measure, the amount of deformity in alignment to be expected when the permanent central, lateral, cuspid and bicuspid teeth appear.

A child of five possessing small deciduous teeth

and little expansion of the alveolar crests of the jaw, yet whose x-rays show large permanent teeth with a greater total linear requirement than the corresponding deciduous teeth already present, cannot fail to develop a malalignment of his permanent dentition. He will probably require extraction in order to make it possible for future orthodontic correction to improve facial appearance or to hold when the appliances are removed.

The linear growth of the posterior portion of the mandible that supports the permanent molars continues to a later date. The most common and almost universal failure of spacing for the third molar among civilized peoples is but one index of inadequate development of the jaw bone.

If a pediatrician evaluated the relative effects of the muscular action of a baby nursing at the breast and of one nursing from a bottle, he would weigh more carefully the wisdom of placing an infant on a bottle. In accordance with Wolff's law, the vigor of the nursing infant and the resistance of the nipple to his effort determine how strong the important muscles of mastication will be. The pull of these muscles acts on their attachments and develops the accompanying bones of the skull and mandible in proportion to the force exerted. Nursing the breast requires a different muscular action and more effort on the part of the infant than nursing from a rubber substitute.

Not only must we consider the growth of the mandible, but we must study the factors in the development of the middle third of the face and the base of the brain, which determine the adequacy of lateral and forward movement of the face. This development determines the direction of the muscular pulls on the oral structures and influences the size and shape of the arches and vault of the mouth, and secondarily, the sinuses of the skull.

Two very important indices of this development are the adequacy of the orbital portion of the zygomatic arch (process fronto-sphenoidalis) and the maxillotemporal portion of the zygomatic arch. In the well developed child, the transverse diameter of the two malar prominences should be equal to, or slightly greater than, the transverse diameter of the fronto-sphenoidal processes.

Most bottle fed infants early show failure of the growth between the malar prominences and a failure in development of an adequate orbital portion of the zygomatic arch. This is partially due to the weakness of muscles common to many bottle fed infants.

During the greater part of the first year, the bones of the face are the only bones subjected to stress—the stress of nursing and chewing. The

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author has pointed out^{7,8} that metabolic upsets such as infectious diseases leave their imprint on developing bones under stress. The recurrent upsets of an allergic process leave even greater effects. As the child begins to walk, the foot and the knee and hip become bones of stress, and evidence of fragmentation in any of these can be interpreted as an index of disturbed dental development.

It is therefore logical that the severely allergic child with his recurrent allergic episodes is likely to experience failure in facio-dental development. It is very important to control the allergic process as quickly as possible to prevent the occurrence of dental deformity. In my own experience, some evidence of failure in alignment or development of the teeth is present in every case of persistent childhood allergy.

Congenital failure in development as well as post-natal injury of other facial structures may exert a definite effect on the developing face. An example of this is the lack of stimulation to growth found in the congenitally blind.

Infections of the nasal passages can also exert an arresting effect on the growing bones of the face and may permanently interfere with occlusion. Failure in the dental structures, especially in the deciduous teeth afflicted with rampant caries, which are now known to be controllable by adequate diets^{9,10,11,12} may not only ruin an otherwise good mouth but may leave a badly scarred area of little use to the orthodontist and a difficult problem to the prosthodontist. The early loss of teeth interferes with the full development of the alveolar bones and their supporting structures, when due to extensive decay.

The mechanical factors of injury can play havoc with the growing face and the occlusion of the teeth, as can the direct infection of the mandible or maxilla from abscesses. Burns of all types can damage the growth of the facial and dental structures, but are relatively few as compared with injurious factors of disturbed metabolism.

The pediatrician has a particular responsibility in recognizing the hypothyroid child and instituting early treatment. These children, when they reach adult life, often suffer loss of teeth due to porosity of bone, and extensive root resorption.¹ Orthodontia in these cases is apt to fail because of the same porous bony structure which cannot support appliances or retain good alignment, however well executed.

The hypogonad child^{2,3} frequently presents a concomitant symptom of missing teeth in either or both the deciduous and permanent dentition. He may show underdevelopment of both mandible

and maxilla. The proper stimulation of the gonads at an early date will also improve the facio-dental development. In a similar manner other endocrine disturbances,^{4,5} especially of the pituitary, should be recognized in early childhood and the proper treatment instituted.

The pediatrician thus undertakes a double trust in assuming the guidance of the health of an infant. He not only treats the infant for infectious diseases and prescribes a diet to meet its growing needs; he directs a program calculated to determine the future dental development of that child.

He can determine by routine x-rays the changing conditions of the skull, and can interpret these findings as prophesies of future requirement for orthodontia. By encouraging the mother to nurse the infant, the pediatrician can early help the child to develop strong facio-dental structures entirely different from those of the bottle fed baby. He can avert or lessen many a dental deformity by recognizing early hypogonad, hypothyroid, and other endocrine disturbances of children and by instituting the proper therapy which, in turn, improves the facio-dental structures. He can also obviate many serious dental problems by checking allergies as quickly as possible, since the continual insult of an allergic process is accompanied by concomitant dental problems. The pediatrician, by means of x-rays taken at regular intervals, should anticipate the future development of orthodontic problems, so that the orthodontist may be consulted at an early date, before the permanent teeth have erupted.

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MEDICAL PROGRESS:

Present Concepts of the Clinical Significance of Unipolar Precordial Electrocardiograms†

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ACCUMULATED experience, supported by animal experimentation, has emphasized the importance of precordial leads in clinical electrocardiography. Many physicians regard precordial leads only as a research tool and their use far too complicated for ordinary clinical study. Recently Wilson, et al.,²⁵ Goldberger,⁷⁻¹³ and Sodi²⁴ have discussed the physiologic concepts and electrocardiographic correlations and have conclusively demonstrated the clinical value of precordial leads.

The standard limb leads are indirect leads and the data they furnish are not comparable to those obtained by direct leads from the epicardium in animals. The standard limb leads are bipolar leads and record the composite differences in potential of two unipolar extremity leads and not that of a single extremity. The standard leads, therefore, reflect the contribution of all portions of the heart, and the effects of small lesions may be overshadowed by the effect of the great mass of normal myocardium. A detailed analysis of precordial leads gives one data comparable to those from direct epicardial leads, the precordial leads being semi-direct leads and not indirect, as are the limb leads. Further, even though limb leads may indicate that myocardial abnormality is present, multiple precordial leads delineate the abnormality more finely and indicate its extent. Precordial leads may reveal localized lesions such as antero-septal or antero-apical myocardial infarction, when limb leads may not be diagnostic. A single precordial lead has the disadvantage of reflecting potential variations solely of that portion of the heart which lies under the electrode. With the common use of a single electrode on the cardiac lead apex (IV F), the problem of accurately locating the exact site of the apex for serial records becomes most important. In addition, precordial leads further to the left of the cardiac apex may reveal abnormalities not seen in leads from the apex (IV F), especially if the heart is enlarged. For this reason Lead IV F is frequently inadequate. Even in normal electrocardiograms, the presence of six normal precordial leads taken over both ventricles is an added assurance of normality and removes the doubt that a localized lesion may be present that was missed in the standard limb leads. Multiple precordial leads are now more extensively used, especially by insurance companies, and if reliance

is placed solely on the results furnished by a single precordial lead, electrocardiography is not utilized to its fullest diagnostic possibilities.

PHYSIOLOGIC CONSIDERATIONS

Lewis²⁰ first showed that by pairing an electrode over the ventricular surface (exploring electrode) with one over the chest wall or over an extremity (indifferent electrode), electrocardiograms were obtained which reflected directly the activity of the part of the heart under the electrode. Wilson, et al.^{16, 26, 27, 28} showed by numerous experiments on normal dogs, and on dogs with induced bundle branch block and with myocardial infarction that a close relation exists—as demonstrated electrocardiographically—between the potential variations of the right side of the precordium and those of the anterior surface of the right ventricle, and between the potential variations of the left precordium and those of the anterior surface of the left ventricle. These correlations were based on comparison of the QRS complexes of precordial leads with the chest intact and later with direct epicardial leads after the heart was exposed by splitting the sternum. These experiments allow one to conclude that precordial leads are, in effect, semi-direct leads from the heart, and that leads from the right precordium reflect activities of the right ventricle and leads from the left precordium reflect activities of the left ventricle.

The potential variations of a given precordial electrode are largely determined by the potential variations of the ventricular surface nearest the electrode. The part of the heart directly under the exploring electrode exerts the major effect on the electrocardiogram and the effects of distant ventricular surfaces are relatively minor, since the magnitude of the contribution of other portions of the heart varies inversely with the cube of the distance.²⁵ This being so, moving the electrode across the precordium in multiple leads enables one to record the potential variations from different parts of both ventricles, and therefore to determine the presence of lesions localized to one part of the heart. The fact that a single precordial lead reflects chiefly the electric activity of a limited part of the heart is one of the main reasons for the necessity of taking more than one precordial lead.^{29, 31}

During a cardiac cycle the potential variations produced by the heart are transmitted to all parts of the body in diminishing degree, depending on the distance from the heart. It has been estimated that the potential variations of the arms or legs are one-thirtieth as great at any given time as those at a point on the ventricular surface.²⁵ Nevertheless, the extremity used for the indifferent electrode possesses sufficient electric potential so as to influence to some degree the form of the ventricular complex obtained by precordial leads. Because of the effect, although small, of the "indifferent" electrode on the precordial tracing, Wilson, et al.,²⁷ introduced a method of reducing the potential of the indifferent electrode to zero. This method involved the construction and use of the "central terminal." The central terminal consists of three lead wires, each connected to a 5,000 ohm resistance, and all joined to a central terminal. Since, according to Einthoven's law, the sum of the potentials of the three extremities at any moment in the cardiac

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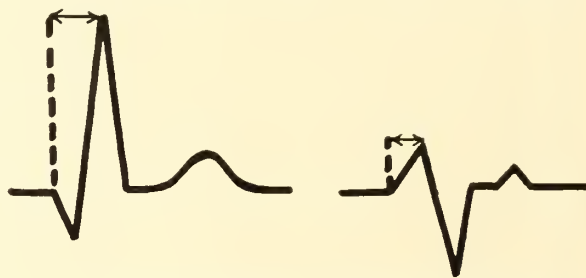
cycle is zero, the potential of the central terminal is zero. Goldberger¹¹ simplified Wilson's apparatus by eliminating the 5,000 ohm resistance. Using either Wilson's or Goldberger's terminal as the site of the indifferent electrode, Wilson has shown that with the exploring electrode over the precordium, unipolar precordial leads could be obtained which are in effect semi-direct leads from the heart. The potential variations reflected in the electrocardiogram are not influenced by the indifferent electrode with zero potential and so the unipolar precordial leads give data that are comparable to those obtained with direct leads from the heart. In the illustrations presented in this paper the Goldberger terminal was used.

The normal spread of the cardiac impulse through the heart is from the endocardium outward to the epicardium. The septum is activated from both sides simultaneously, although Goldberger believes the left is activated first. The positive pole of a wave of excitation is in the direction to which the impulse is spreading, and the negative pole is in the direction from which the impulse is passing.²¹ Since an area from which the activation wave proceeds or one facing the end of the wave is negative, the ventricular cavities normally possess a negative potential. An electrode on the epicardium, however, faces an oncoming wave of excitation and therefore records an initial positive potential. The electrocardiographic tracing is so adjusted that the positive potential is shown by an upward deflection (R wave) while a negative potential has a downward deflection (Q or S wave). An epicardial electrode may not only face an oncoming excitation wave and so have an initial positivity (R wave) but it may later face the end of the spreading wave of excitation in some other part of the heart and record a negative potential (S wave). If the electrode faces the end of a wave that is activating another portion of the heart prior to activation of the muscle directly under the electrode, the electrocardiogram will record an initial negative deflection, or Q wave. Therefore the form of the QRS complex in precordial leads depends on the spread of the excitation wave, and whether the precordial electrodes face the beginning or the end of the wave of excitation at different periods during the QRS interval.

THE CONCEPT OF THE INTRINSIC DEFLECTION

Wilson, et al.,²⁵ and Sodi,²⁴ have emphasized the importance of the intrinsic deflection. In normal subjects, the QRS complex displays an abrupt downward deflection, corresponding to the intrinsic deflection of direct ventricular leads. This abrupt downstroke indicates that the epicardial surface of the anterior ventricular wall underneath the exploring electrode has been activated by the cardiac impulse and the wave of excitation has passed. Since the activation wave in the heart spreads from the endocardium to the epicardium, the time interval between the onset of QRS and the peak of R (or beginning of the downstroke of the intrinsic deflection) gives information regarding hypertrophy or defects in conduction in the area of the heart studied. The intrinsic deflection appears early in the QRS interval in leads from the right precordium because of the relative thinness of the wall of the right ventricle. The intrinsic deflection appears late in the QRS interval in leads from the left precordium because of the relative thickness of the left ventricle. As will be discussed later, this fact is of great importance when ventricular hypertrophy and bundle branch block are considered. Figure 1 illustrates the method of determining

the time of onset of the intrinsic deflection. The onset of the intrinsic deflection is preceded by an upward stroke of variable amplitude due to the spread of the activation wave through the ventricular wall from the endocardium to the underlying epicardium. The pre-intrinsic upward deflection (positive or plus polarity) prior to the onset of the intrinsic deflection may or may not be preceded by a Q wave. If the intrinsic deflection occurs early in the QRS interval (right pre-



INTRINSIC DEFLECTION

Fig. 1.—Method of measuring the onset of the intrinsic deflection.

cordium), there may be a postintrinsic downward deflection (S wave) as the beam crosses the isoelectric line. This is due to the subsequent activation of ventricular muscle adjacent to and distant from that underlying the exploring electrode. When the epicardial surface under the electrode represents the last portion of the ventricular muscle to be activated (left precordium), there usually is no postintrinsic S wave. Therefore, the size of R and S waves in precordial leads is related to the time of onset of the intrinsic deflection: When the onset of this deflection is early, R is small and S is deep; when it occurs later, R is tall and S may be small or absent.

THE NORMAL PRECORDIAL ELECTROCARDIOGRAM

Some years ago a committee of the American Heart Association for Standardization of Precordial Leads¹ advocated six positions on the precordium from which precordial leads could be taken so as to reflect the activities of both the right and left ventricles. In addition, they proposed the use of one of four sites for indifferent electrodes, namely, the right arm, left arm, left leg, or central terminal. They suggested that precordial or chest leads be labeled C, with a second letter added—depending on the site of the indifferent electrode—such as CF for left leg, CR for right arm, and CL for left arm. As one takes leads across the precordium from right to left, the various positions are numbered one through six, and a lead, labeled, for example, CF II, indicates a chest lead with the exploring electrode in position two and the indifferent electrode on the left leg. If unipolar precordial leads are taken, they are labeled V leads. The six positions are illustrated in the diagram of Figure 2.

Unipolar precordial leads, then, are those in which the indifferent electrode is attached not to an extremity as in ordinary precordial leads (CF, CR, CL) but to a central terminal whose poten-

tial is essentially zero. When the exploring electrode is placed on an *extremity* instead of the heart, and the indifferent electrode is attached to the central terminal, one has a unipolar *limb* lead in which the potential variations solely of the limb involved are recorded.

Although unipolar precordial leads are preferable to precordial leads in which the indifferent electrode is placed on an extremity and not in a

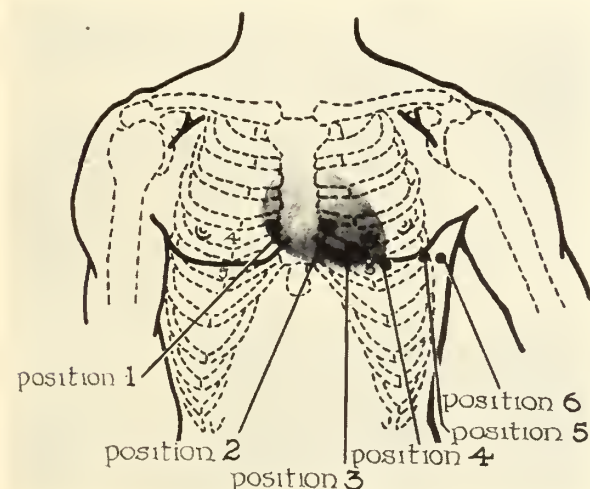


Fig. 2.—Diagrammatic sketch illustrating the six precordial positions.

central terminal of zero potential, the ordinary precordial leads are adequate for clinical purposes. Further, most electrocardiographic machines do not have the central terminal attachment although it can be purchased, or a simple unit such as described by Goldberger¹¹ can be inexpensively made. Unipolar precordial leads are simple to take, and no more difficult than ordinary precordial leads.

TABLE 1.—Normal Precordial Leads

1. P wave may be upright, diphasic or inverted.
2. Q wave is absent in V_1 and V_2 , variable in V_3 , usually present in V_4, V_5, V_6 . Maximum normal is 3 mm.
3. R wave is small in V_1 and is progressively larger up to V_4 , when it gradually decreases in size to V_6 .
4. S wave is deep in V_1 and is gradually smaller as the left side of the precordium is approached. It may be absent in V_5 and V_6 .
5. T wave may be inverted or upright in V_1 , variable in V_2 , and progressively taller with maximum height in V_4 . It then decreases and may be low in V_6 . In children, T may be inverted in V_1 to V_4 , but is usually upright in V_5 and V_6 .
6. The transitional zone between the right and left side of the precordium is usually V_3 , but this is variable and it may be V_2 or V_4 , or the zone may include several positions.

Table 1 summarizes the features of the normal precordial electrocardiogram in adults using unipolar leads.^{3, 5-13, 17, 23-25, 30} It will be seen in Figure 3 that in leads from the right precordium (V_1 and V_2), R is small and may be absent, S is deep, and the intrinsic deflection (peak of R coinciding with abrupt downward deflection QRS) occurs relatively early in the QRS interval. These complexes are similar to those obtained in direct leads from the anterior wall of the thin right

ventricle of the dog. In leads from the left precordium (V_5 and V_6), R is tall and S is small and the intrinsic deflection occurs late in the QRS interval. These complexes are similar to those obtained in direct leads from the anterior wall of the thicker left ventricle of the dog. Q waves may appear normally in V_5 and V_6 and occasionally in V_4 , but never exceed .03 second in duration and are less than 25 per cent of the R wave in the same lead. The peak of R occurs, according to Kossman and Johnston,¹⁹ an average of .02 second later in left precordial than in right precordial leads. The absolute upper limits of normal for the intrinsic deflection in various precordial leads have not been established, but .04 second is considered maximum for the left precordium, and .02 second for the right precordium V_1 .

The size and form of R and S waves in the intermediary zones between the right and left precordium (V_3 and V_4) are variable in normal individuals. There is a progressive increase in size of R from V_1 to V_4 as the precordial electrode is moved across the chest from the area of the thinner right ventricle (V_1) to the area of the thicker left ventricle. The maximum R may be in V_5 . As the electrode is moved beyond the left lateral border of the heart, R becomes smaller and may be small in V_6 . The peak of the R wave occurs less than .02 second after the onset of QRS in V_1 and V_2 , but progressively appears later in the QRS interval, so as to be .03 to .04 second in V_5 and V_6 . The amplitude of the T wave follows the changes noted above in the R wave but the S wave is inversely proportional. The S wave is deepest in V_1 and V_2 and gradually becomes smaller and may be absent in V_6 and V_5 and perhaps in V_4 . The T wave may be inverted in V_1 and perhaps in V_2 and is frequently flat or very low in V_6 . In children, T may be inverted in V_1 to V_4 , but usually it is normally upright in V_5 and V_6 .

UNIPOLAR LIMB LEADS AND THE ELECTROCARDIOGRAPHIC POSITIONS OF THE HEART

Wilson, et al.,²⁵ have indicated that the anatomic and the electrocardiographic positions of the heart, while usually similar in normal subjects, may differ in patients with abnormal hearts. They have shown that some unusual or atypical patterns of ventricular hypertrophy, bundle branch block, and perhaps myocardial infarction in standard limb leads may be due to the electrocardiographic position of the heart. They have demonstrated that the precordial patterns of these conditions are not influenced by the mean electric axis, while the standard limb leads may be strikingly different, depending on the electric axis. Since the potential variations of an extremity are dependent upon, and similar to, that portion of the heart to which the extremity is directed, it is possible, by comparing the ventricular complexes of the extremities (by means of unipolar limb leads) with those of the right and left precordium, to analyze the spatial relationship between the surfaces of the two ventricles and the limbs. In this way one may visualize the relative position

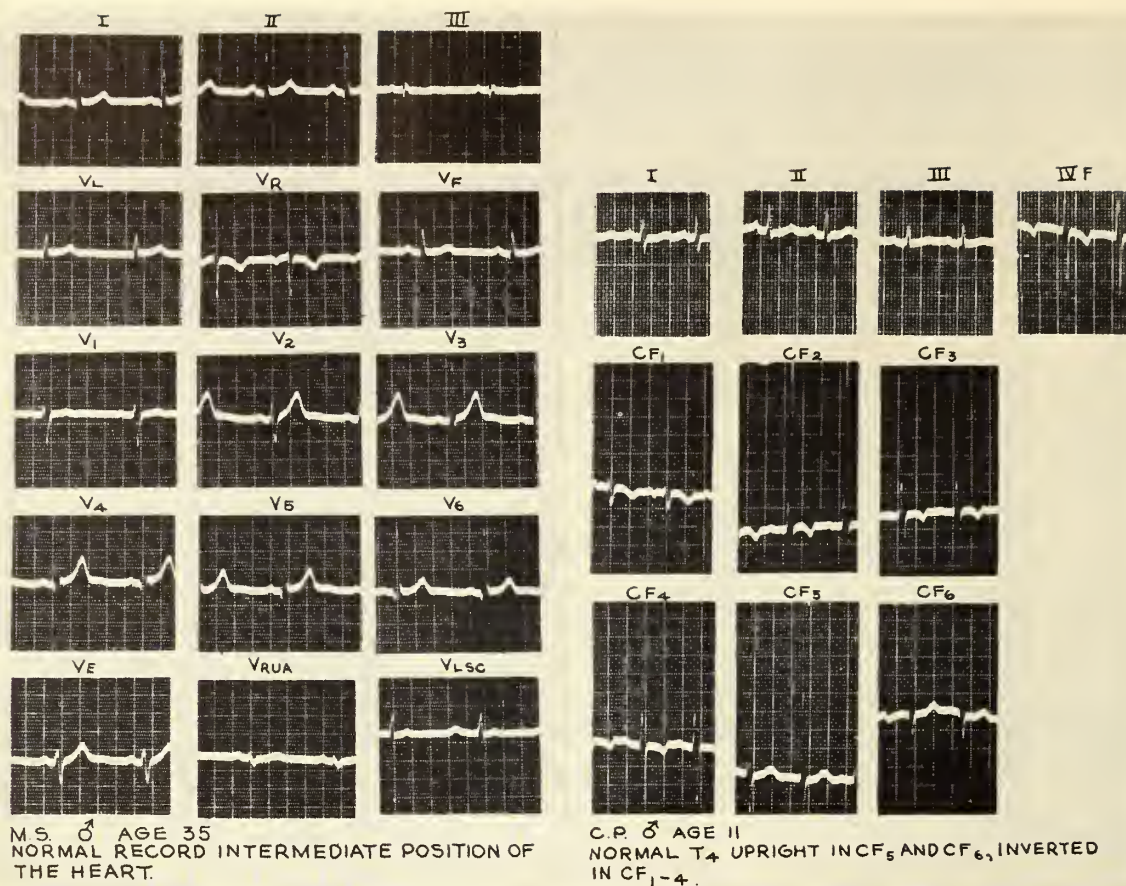


Fig. 3.—The normal precordial electrocardiogram. The Goldberger central terminal was used in this and the following illustrations.

of the heart from an electrocardiographic standpoint. In unipolar limb and precordial leads, if VL (left arm) resembles V₅ or V₆, the potential variations of the left ventricle have been transmitted to the left arm. This enables one to visualize that the heart is horizontal in position and this is further supported by noting that VF (left leg) resembles V₁ and V₂, indicating that the potential variations of the right precordium are transmitted to the left leg. Individuals with horizontal hearts usually have left axis deviation in the standard limb leads. If VL resembles V₁ or V₂ and VF resembles V₅ and V₆, it is apparent that the heart has rotated in such a manner that the potential variations of the left precordium are transmitted to the left leg and those of the right precordium to the left arm. The heart, therefore, is in the vertical position. Individuals with vertical hearts usually have right axis deviation or a tendency to right axis deviation in the standard limb leads. On the basis of these assumptions, Wilson has summarized five basic electrocardiographic positions of the heart (Table 2). In normal subjects one can demonstrate the relationship between right axis deviation and vertical hearts and between left axis deviation and horizontal hearts. For the purpose of this article, the main value of unipolar limb leads lies in the fact that the electrocardiographic position of the heart can be determined, thereby aiding in the interpretation of the

TABLE 2.—*Electrocardiographic Positions of the Heart*

Vertical Position

1. Ventricular complexes of VL resemble those of the right side of the precordium (V₁, V₂).
2. Ventricular complexes of VF resemble those of the left side of the precordium (V₅, V₆).

Semi-vertical Position

1. Ventricular complexes of VF resemble those of the left side of the precordium (V₅, V₆).
2. Ventricular complexes of VL are small.

Intermediate Position

The ventricular complexes of VL and VF are similar in size and form, and resemble those of the left side of the precordium (V₅, V₆).

Semi-horizontal Position

1. The ventricular complexes of VL resemble those of the left side of the precordium (V₅, V₆).
2. The ventricular complexes of VF are small.

Horizontal Position

1. The ventricular complexes of VL resemble those of the left side of the precordium (V₅, V₆).
2. The ventricular complexes of VF resemble those of the right side of the precordium (V₁, V₂).

Indeterminate

electrocardiographic patterns that otherwise would be considered atypical.

ELECTROCARDIOGRAPHIC PATTERNS

Bundle Branch Block

Unipolar precordial leads have greatly expanded and clarified our knowledge of bundle branch block. Various terminology has been used in the past in an attempt to explain the apparent varieties of branch block as seen in standard limb leads. This has led to some confusion. Wilson's

studies, however, have shown that the many variations in the patterns in standard limb leads depend not only on the branch of the bundle of His that is blocked, but also on the electrocardiographic position of the heart. Since the relations between the surfaces of the two ventricles and the extremities vary with the position of the heart, the pattern in the limb leads will vary in different patients with the same type of bundle branch block, depending upon the position of the heart. Thus unipolar limb leads in patients with suspected bundle branch block permit one to visualize the electrocardiographic position of the heart by noting to which extremity the potential variations of the right and left ventricle are transmitted. Unipolar precordial leads indicate which ventricle is activated late, hence indicating its bundle has been blocked. As already stated, the time of onset of the intrinsic deflection (peak of R) in relation to the onset of QRS allows one to determine the time of spread of the impulse from the endocardium to the epicardium. Therefore if the intrinsic deflection is markedly delayed in leads from the left precordium, a left bundle branch block is present, and if delayed over the right precordium, a right bundle branch block. This is true regardless of the axis deviation in the limb leads, which simply reflects the electrocardiographic position of the heart. Thus we may have a right bundle branch block with either right, left, or no axis deviation.

By correlating the effects of experimentally induced bundle branch block in dogs and those found in human subjects, Wilson concluded that a diagnosis of which bundle is blocked can often be made solely from inspection of the standard Lead I. Thus, a right bundle branch block is characterized by a QRS interval of .12 second or more with a biphasic or triphasic QRS complex and a definitive S wave that is broad, slurred, or notched. A left bundle branch block shows a QRS interval of .12 second or more, and a QRS complex that is monophasic, not associated with an S wave, and with a broad, slurred or bifid R. In doubtful cases, unipolar precordial leads will be decisive and will demonstrate marked delay in the appearance of the intrinsic deflection, depending on which ventricular surface is activated late. We have seen cases of right bundle branch block in which the QRS interval in the limb leads did not exceed .10 second, with a small Q and S wave in Lead I.

Goldberger⁸ has emphasized the importance of "W" and "M" shaped QRS complexes in the diagnosis of bundle branch block by precordial leads. The "M" shaped QRS complexes—which, in our experience, are more consistently found—are present in precordial leads over the delayed ventricle, while the "W" shaped complexes are present over the normal ventricle. Thus in left bundle branch block, V₅ and V₆ will show "M" shaped, monophasic QRS complexes. The explanation lies in the mode of passage of the activation wave through the interventricular septum. In left bundle branch block, in leads V₅ and V₆, the first upstroke of R represents the initial positivity of the

left ventricular cavity while the electric impulse is passing through the septum from right to left; the second upstroke represents the late activation of the left ventricular muscle.

The first region to be activated in left bundle branch block is the right side of the septum. The impulse then passes through the septum to the left, thus producing an initial positivity in the leads facing the oncoming excitation wave, i.e., the leads facing the left side of the septum (V₅ and V₆). The leads facing the end of the wave have an initial negativity, i.e., the leads facing the right side of the septum (V₁ and V₂). The wave of excitation then spreads through the right ventricle and the negative wave in V₁ and V₂ terminates. As the wave spreads through the right ventricle, leads from the left side of the heart (V₅ and V₆) face the end of the wave and record a negative deflection (the first downstroke of the "M"). This downstroke is interrupted by the beginning of the spread of the wave of excitation through the left ventricle which had been delayed by passage of the impulse from right to left through the septum. With left ventricular activation, V₅ and V₆ now face an oncoming wave of activation and record a positive deflection, the second upstroke of the "M." At this time leads from the right ventricle, V₁ and V₂ face the end of the left ventricular wave and record the second negative deflection, or second downstroke of the "W." When the wave of activation reaches the epicardial surface under the exploring electrodes of V₅ and V₆, the intrinsic downward deflection occurs in V₅ and V₆, recording the final downstroke of the "M." Because of the initial positivity of the left ventricular cavity, the first deflection in left bundle branch block is upright or an R wave. The presence of Q waves in left ventricular leads in left bundle branch block either means that the diagnosis is in error and that a marked left ventricular hypertrophy is present, or one must assume a septal lesion with a "physiologic hole" so that the negative potential of the right ventricular cavity is directly transmitted to the left ventricular cavity.

TABLE 3.—Left Bundle Branch Block

1. QRS interval is .12 second or more.
2. QRS in Lead I is monophasic with broad, slurred or bifid R wave.
3. Axis deviation in limb leads depends on the position of the heart.
4. "M" shaped complexes with intrinsic deflection occurs late in the QRS interval (.06 to .10 second) in leads from the left side of the precordium.
5. "W" shaped complexes occur with small or absent R waves in leads from the right side of the precordium.
6. Q wave is absent in leads from the left side of the precordium except when septal lesions are present.

TABLE 4.—Right Bundle Branch Block

1. QRS interval is .12 second or more.
2. QRS complex in Lead I is biphasic or triphasic, ending with a broad, slurred or notched S wave.
3. Axis deviation depends on the position of the heart.
4. "M" shaped complexes with intrinsic deflection occur late in the QRS interval in leads from the right side of the precordium.
5. "W" shaped complexes with small R and prominent S waves occur in leads from the left side of the precordium.

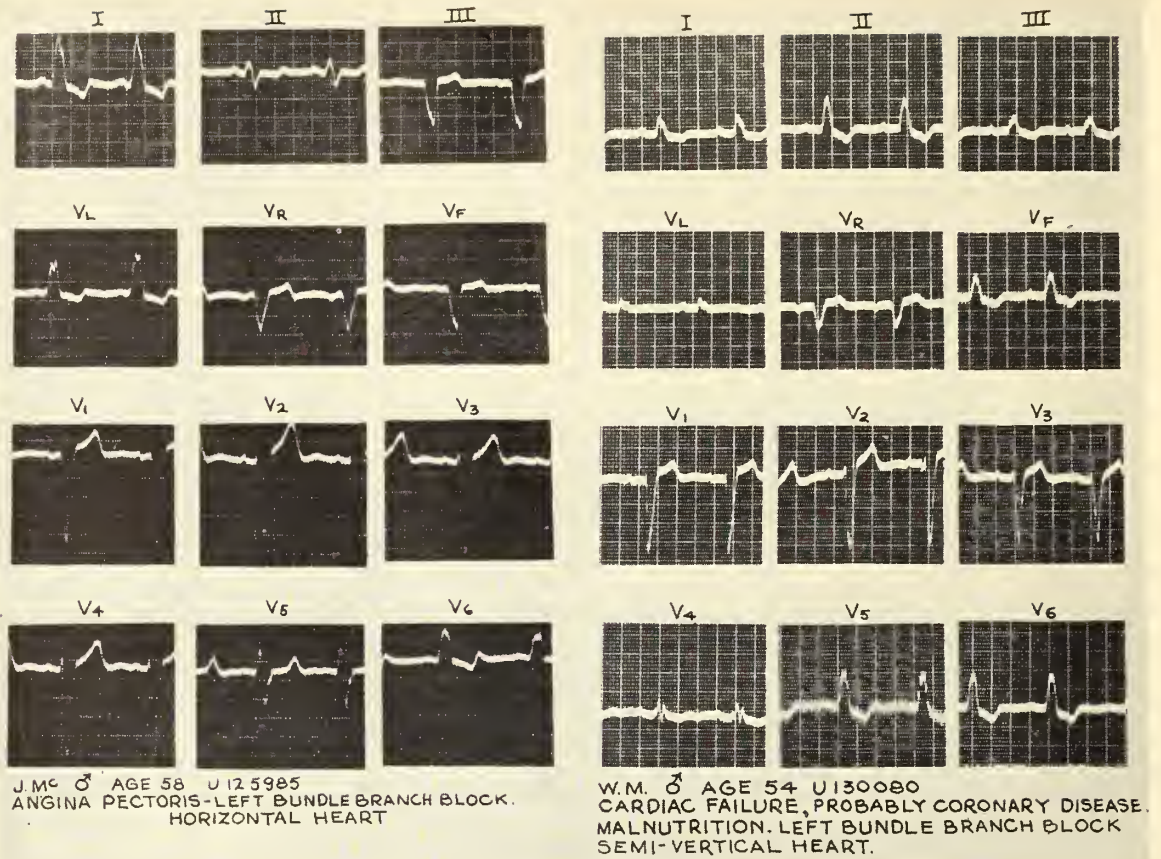


Fig. 4.—Left bundle branch block.

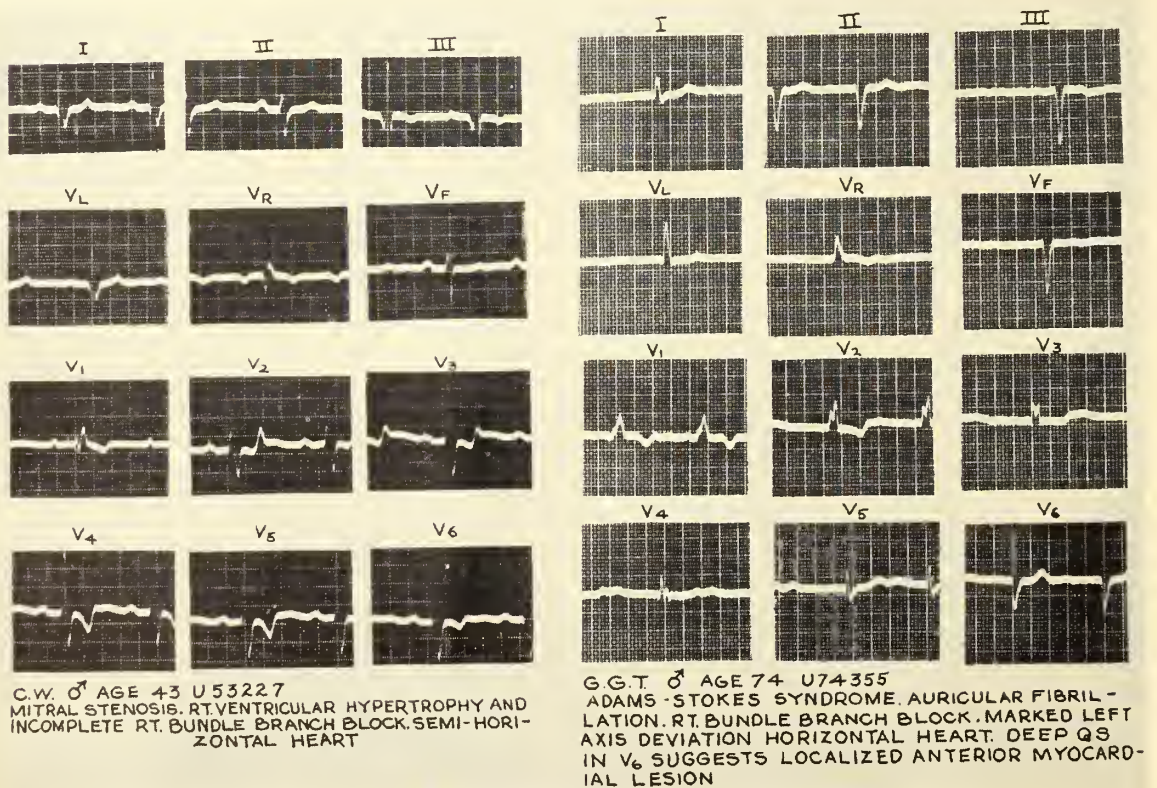


Fig. 5.—Right bundle branch block.

The description of the electric events in left bundle branch block can be reversed in right bundle branch block, replacing left with right and V₅ and V₆ with V₁ and V₂.

Tables 3 and 4 summarize the findings in bundle branch block and figures 4 and 5 illustrate bundle branch block in various electrocardiographic positions.

Ventricular Hypertrophy

Precordial leads in ventricular hypertrophy are not so bizarre as in bundle branch block but reflect the increased thickness and size of the ventricular walls. Again, the electrocardiographic position of the heart varies the pattern seen in the standard limb leads, so that one may see a variety of patterns in these leads while the precordial leads follow a single pattern, regardless of the position of the heart. The common pattern

trophy in order to demonstrate how the position of the heart may vary the pattern in the electrocardiogram of the standard limb lead.

In left ventricular hypertrophy, because of the increased mass of the left ventricular muscle, the QRS interval approaches .10 or .11 second, the voltage of the QRS in the left precordial leads may be greater than normal, and the onset of the intrinsic deflection in left precordial leads is usually delayed, both absolutely and in relation to the time of onset of the intrinsic deflection in right precordial leads. In leads V₅ and V₆ and occasionally in V₄, the intrinsic deflection usually exceeds .04 second, and commonly is .06 second, indicating delay in the time required for the impulse to pass from the endocardium through the hypertrophied muscle to the epicardium of the left ventricle. We have seen cases of left ventricular

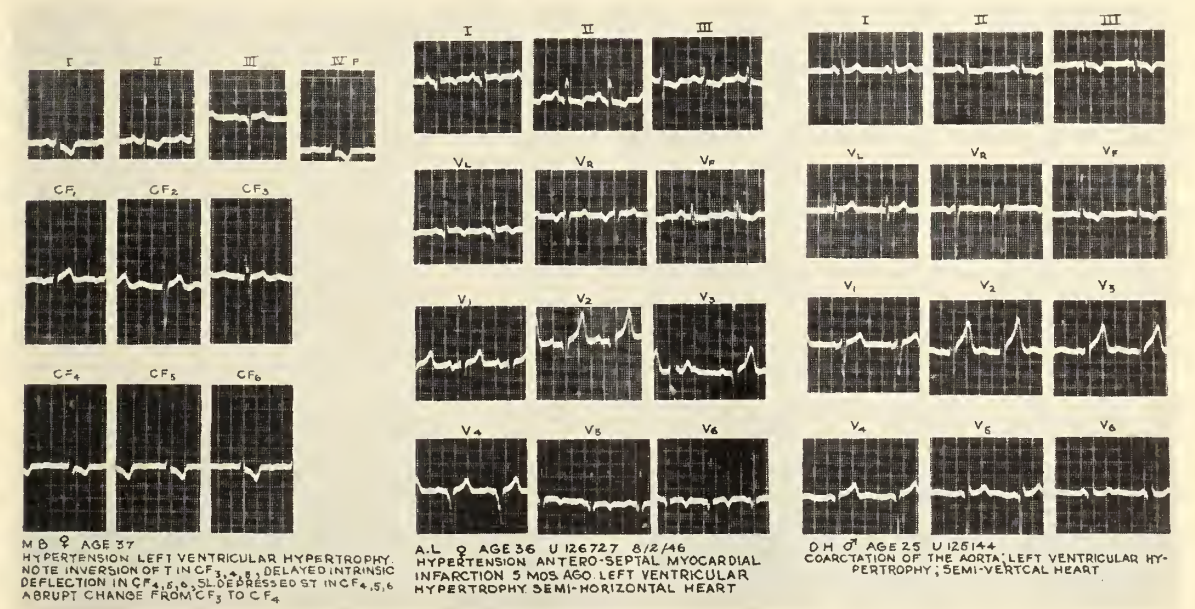


Fig. 6.—Left ventricular hypertrophy.

of left ventricular hypertrophy described by Barnes,² by Katz,¹⁸ and by Gubner and Ungersleider¹⁴ occurs in horizontal or semi-horizontal hearts. Since horizontal hearts are those most frequently found in patients with left ventricular hypertrophy, the combination of marked left axis deviation, high voltage R-1 and S-3 and later ST-T changes in Lead I, has come to be recognized as most typical of left ventricular hypertrophy. However, in vertical or semi-vertical hearts with left ventricular hypertrophy, this pattern is not present; there may even be right axis deviation, and the interpretation of the electrocardiogram has often been incorrect. Studies of these cases, however, reveal precordial leads similar to those obtained in patients in whom the standard limb leads showed the characteristic common pattern of left ventricular hypertrophy. It is necessary, therefore, to study the standard limb leads in conjunction with precordial and unipolar limb leads in patients with such a hyper-

trophy, proved by roentgenologic examination, in which the onset of the intrinsic deflection did not exceed .04 second. It is apparent that not all of the typical features need be present in all cases. The precordial tracings of left ventricular hypertrophy differ from left bundle branch block in leads V₄, V₅, V₆, in that Q waves are commonly seen, the R wave is not appreciably slurred nor notched and the QRS complex rarely exceeds .11 second. There are some borderline transitional cases, where one may have difficulty identifying *incomplete* bundle branch block. The ST interval may be depressed and the T wave may be inverted in left ventricular hypertrophy. These ST-T changes have been attributed to anoxemia of the anterolateral wall of the left ventricle.⁴ These ST-T wave changes may be seen only in V₅ or V₆ and may be missed if only one (IV P) precordial lead is taken. Figure 6 is representative of left ventricular hypertrophy and Table 5 tabulates the typical diagnostic findings.

In right ventricular hypertrophy, the increased thickness of the right ventricular wall tends to decrease the difference between it and the left ventricular wall. The voltage and duration of R in right precordial leads increase, although they rarely approach the size of R in left precordial leads. The intrinsic deflection in right precordial leads (V_1 , V_2) is delayed, exceeding .02 second, often approaching .04 to .06 second, and it may

TABLE 5.—Left Ventricular Hypertrophy

1. Increased voltage of QRS is present in both limb and precordial leads; R_1 plus S_5 equals or exceeds 25 mm.
2. ST_1 is depressed, and T_1 is low to inverted.
3. Axis deviation depends on the position of the heart, left if horizontal, and right or none, if vertical or semi-vertical.
4. In vertical hearts, R_2 and R_3 are tall with diphasic or inverted T_2 and T_3 .
5. QRS duration is .10 to .11 second.
6. R waves are small or absent in leads from the right side of the precordium (V_1 , V_2 , perhaps V_3).
7. Delayed intrinsic deflection occurs in leads from the left side of the precordium (V_5 , V_6).
8. T wave is inverted in leads from the left side of the precordium (V_5 , V_6), and ST is displaced in the same direction as the T wave.

equal or exceed the intrinsic deflection from left precordial leads (V_4 , V_5 , V_6). The delay in the peak of R in these leads over the right ventricle is due to the increased time required for the spread of the wave of activation through the hypertrophied right ventricle. S waves, normally prominent in V_1 and V_2 , often become small or are absent. The record resembles that of right bundle branch block, especially in marked right ventricular hypertrophy, but the QRS is less than

.12 second, the R waves are not broad and notched, and there may be Q waves in V_1 , V_2 and V_3 . The T waves may be inverted in V_1 and V_2 , but since this may occur normally, it is of lesser diagnostic significance. When the inverted T waves are accompanied by a depressed ST interval in the same leads, they are of greater diagnostic significance. In left precordial leads, S may be prominent and R is usually relatively smaller than normal. Table 6 tabulates the findings in typi-

TABLE 6.—Right Ventricular Hypertrophy

1. Axis deviation depends on the position of the heart; usually right with a vertical heart.
2. R_2 and R_3 are tall, with diphasic or inverted T_2 and T_3 .
3. R wave is taller than normal in leads from the right side of the precordium (V_1 , V_2).
4. Intrinsic deflection is delayed in V_1 and V_2 .
5. Q may be present in leads from the right side of the precordium, while S is usually absent.
6. T wave is inverted in V_1 and V_2 (leads from the right side of the precordium).

cal right ventricular hypertrophy and Figure 7 illustrates representative cases. It can be seen that that standard limb leads may show right axis deviation, no axis deviation, or a prominent S in all three leads, depending upon the position of the heart.

Precordial leads have been of the greatest value in demonstrating anterior myocardial infarction when the standard limb leads were either normal or showed a nonspecific abnormality.^{15,18,22,29} Direct unipolar precordial leads in experimentally produced myocardial infarction in dogs have clarified the electrocardiographic picture of this im-

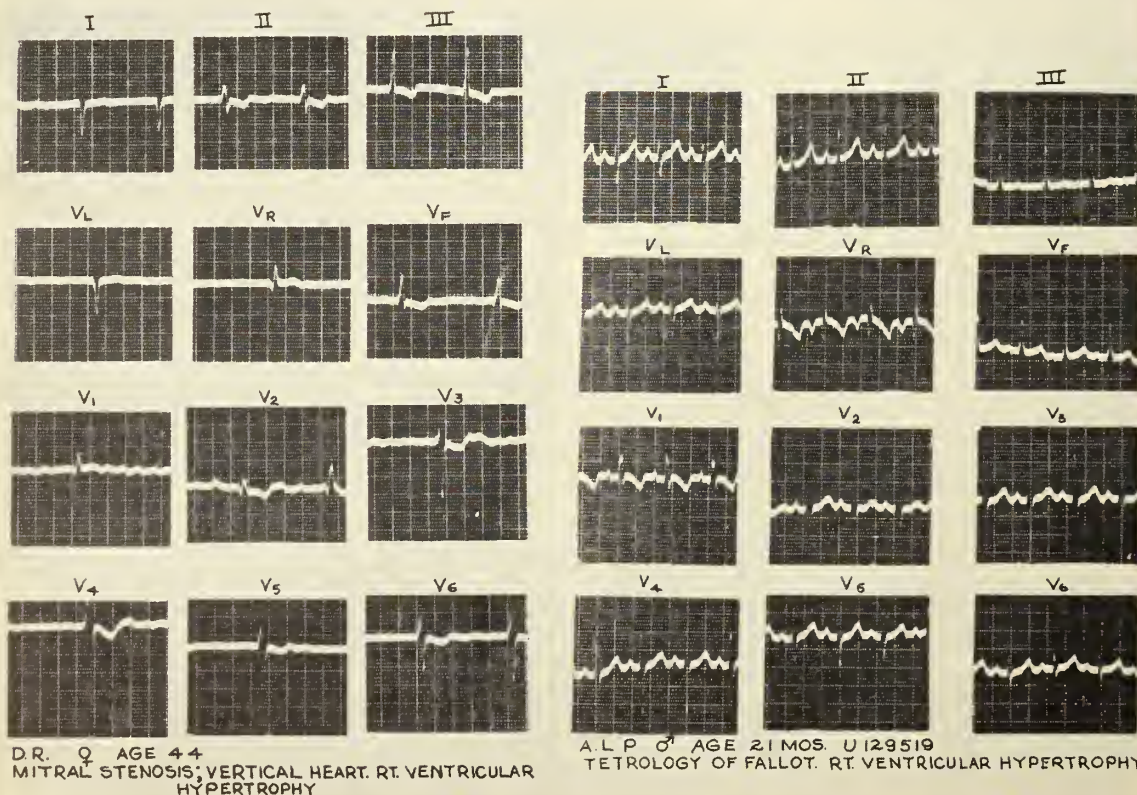


Fig. 7.—Right ventricular hypertrophy.

portant condition. Wilson and his group have found that one can determine not only the presence of myocardial infarction, but that its size, depth and location can be deduced from multiple uni-

TABLE 7.—*Myocardial Infarction*

1. QRS, RS-T segment, and T wave changes must be characteristic before making unequivocal diagnosis of myocardial infarction solely from the electrocardiogram.
2. Deep QS complexes in leads from the left side of the precordium indicate involvement of the entire thickness of the ventricular wall.
3. Deep QS complexes with notching indicate areas of cardiac muscle alive between electrode and adjacent ventricular cavity.
4. Deep Q wave followed by an R wave indicates that outer layers of the ventricular wall are relatively normal.
5. Q waves in leads from the right side of the precordium in right bundle branch block, and in leads from the left side of the precordium in left bundle branch block suggest associated myocardial infarction.
6. Anterior infarction associated solely with inverted T waves without QRS abnormalities in precordial leads are of lesser severity than those with QRS changes.
7. A T wave lower or a Q wave deeper in one precordial position than those in adjacent positions suggests localized myocardial damage.

polar precordial leads. This is of great importance in estimating the seriousness of the lesion. Changes in the electrocardiogram in coronary disease are dependent on actual myocardial abnormality, such as transient myocardial ischemia (as in attacks of spontaneous or induced angina pectoris), myocardial fibrosis and myocardial infarction. Precordial leads aid in evaluating the extent of the myocardial abnormality, not the coronary disease, per se.

Concept of central, marginal and ischemic zones. When an infarct is produced in the myocardium, it can be shown that not all areas of muscle are equally involved. If the infarct is large, it may have a central zone of complete necrosis with the entire thickness of the left ventricle involved. Surrounding the central zone is a marginal zone where only a portion of the ventricular wall is involved, usually subendocardial, infrequently subepicardial. Beyond the marginal zone will be found a larger ischemic zone where the involved muscle has impaired blood supply but is still alive and responsive. The size of these three zones is variable and the central zone may be absent if the infarct is small. Multiple precordial leads, by demonstrating the size of these various zones, are of value in allowing one to estimate the size of the infarct.

The most important of the changes in the electrocardiogram in cases of myocardial infarction concern the QRS complexes, because depth is involved (central or marginal zones), whereas infarction associated solely with ST-T changes is rarely extensive or significant (ischemic zone) (Wilson²⁵). When the infarction involves the entire thickness of the ventricular wall (central zone), the muscle is incapable of responding to the cardiac impulse, the infarcted area fails to undergo activation, and the potential variations of the ventricular cavity are transmitted to the epi-

cardial surface of the involved area. Since the ventricular cavity is electrically negative throughout the QRS interval, exploring electrodes placed over the epicardial surface of the central zone of an infarct will reflect this negative potential and the electrocardiogram will show a deep QS complex, without an R wave. The transmural infarcted muscle has been likened to an "electric window," a "physiologic hole" in the wall of the ventricle because the potential of the ventricular cavity and the epicardium is the same, as though no myocardium existed. Thus a deep QS complex in a precordial lead further to the left than V₂ usually means infarction with involvement of the entire thickness of the ventricular wall.

If the infarction in the central zone is not complete and islands of cardiac muscle in the area remain active, notching of the QS occurs, because of abortive areas of muscle responding to the wave of excitation. In the marginal zone, when the outer layers of the ventricular wall are fairly normal while the subendocardial muscle is infarcted, the negative potential of the ventricular cavity (Q wave) will be transmitted to the boundary between infarcted and normal muscle. In such a case the spread of the excitatory process through the normal myocardium will give a positive R wave and the electrocardiogram will show a deep Q wave followed by an R wave. Thus if the precordial electrocardiogram reveals a deep QS, one may conclude that the full thickness of the ventricular wall is involved in infarction; if a notched QS is recorded, one may assume that isolated areas of functioning muscle remain; if a deep Q followed by a small R is present, one may conclude that the infarct involves the subendocardial area of the ventricular wall, and that the outer subepicardial layer is relatively normal. In the QR complexes of subendocardial myocardial infarction, the Q wave has a duration greater than .03 second and its depth exceeds 25 per cent of the R wave in the same lead. These findings are of importance particularly if the adjacent lead to the right has an R wave. Thus in V₁ and V₂, a small R may occur in normal hearts or in those with left ventricular hypertrophy. If an R wave is present in V₁ or V₂ but disappears or becomes smaller in V₃ and V₄, and Q waves appear, the evidence for myocardial infarction is more conclusive than if the R waves are small in V₁, V₂ and V₃. Similarly, the R waves normally are smaller in V₅ and V₆ than in V₁, so that decreased voltage of R in these leads is not significant, unless the decrease is extreme. Deep Q waves in V₃ to V₆, when of the type described in central or marginal zones, are diagnostic, but they are of lesser value when tall R waves are present, and the Q wave is less than 30 per cent of the R wave. Q waves up to 3.0 mm. deep may appear in the left precordial leads in left ventricular hypertrophy but in this condition the voltage of R in these leads is high.

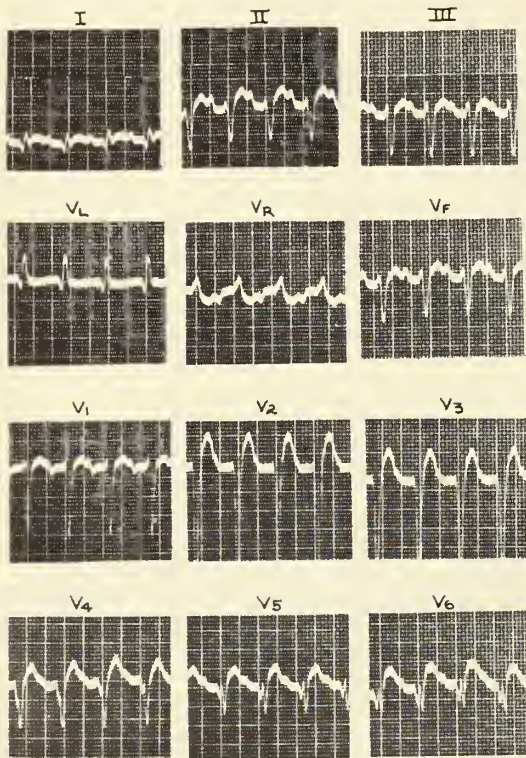
Having determined the depth of the myocardial infarction by the appearance of QS and deep, wide Q waves, multiple precordial leads may

allow one to estimate the extensiveness of involvement in a lateral direction. If characteristic QRS changes are present in only one or two leads (as V_2 and V_3 in antero-septal infarction or in V_6 in lateral infarction), the area of infarction can be considered to be fairly well localized. On the other hand, if the characteristic QRS changes are present in five or six of the precordial positions, the infarction must be extensive (Fig. 8). Thus we may conclude the depth and the extent of an infarction by the use of precordial leads.

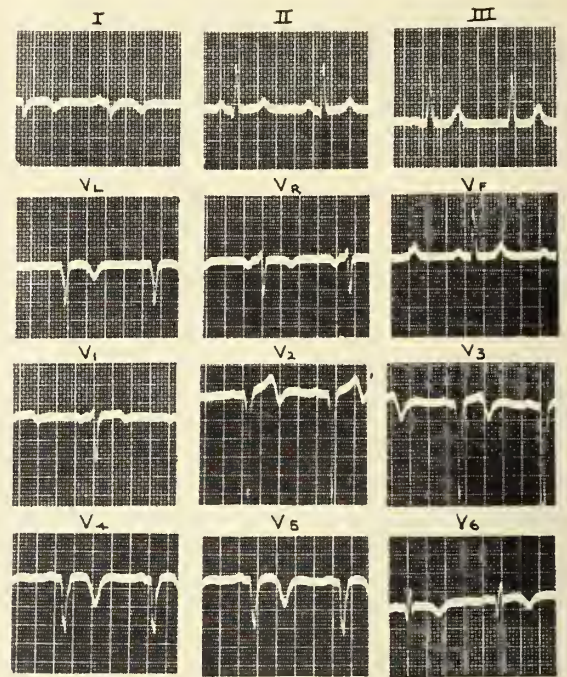
One frequently sees characteristic ST-T wave changes extending beyond the precordial positions

muscle is of small extent. The abnormally inverted T waves in the ischemic zone have been attributed to abnormal repolarization.

ST changes are of value in the diagnosis of myocardial infarction when they have a characteristic contour and follow a convex or coved typical evolution, including the subsequent inversion of the T wave. When the artery that supplies the area of the heart upon which the exploring electrode rests is ligated, the ST segment is displaced upward. This ST change lasts from hours to days and then the ST segment returns toward the iso-electric line. Coinciding with the



G.D. ♂ AGE 58 7/10/46
EXTENSIVE ANTERIOR AND POSTERO-LATERAL MYOCARDIAL INFARCTION INVOLVING FULL THICKNESS OF LEFT VENTRICULAR WALL, ON 7/5/46. HORIZONTAL HEART.



G.E. ♂ AGE 38 U126523
EXTENSIVE MYOCARDIAL INFARCTION 1 YEAR AGO LEFT VENTRICULAR ANEURYSM. VERTICAL POSITION OF HEART.

Fig. 8.—Extensive myocardial infarction.

in which typical QRS changes occur. This has also been noted in direct leads in experimentally produced myocardial infarction. In these animals, the T wave changes were often more conspicuous from the margins of the infarct rather than from the center, presumably being a reflection of the ischemic zone which extends beyond the marginal zone when an infarct is produced. Thus the extent of the T changes reflect the extent of the ischemic zone while the QRS changes reflect the extent of the infarcted areas. On the basis of these observations, Wilson has stated that myocardial infarction associated solely with T changes is rarely serious because only the electric potential of ischemic muscle is recorded, and "dead"

subsidence of the ST elevation, sharp, late inversion of the T wave appears. The T wave inversion lasts considerably longer and the wave may eventually return to normal, as does the ST interval. The ST-T changes are associated with injury and ischemia and are usually not permanent; although they may persist indefinitely at any stage of evolution; the QRS changes are almost always permanent and are associated with myocardial death. QRS changes, therefore, are more reliable than ST-T changes in determining the presence of old *healed* myocardial infarction, although ST-T changes, when characteristic in type and evolution are more typical of *recent* myocardial infarction. T wave changes may be due to many

causes, of which ventricular hypertrophy, conduction defects and digitalis are common ones. The diagnosis of recent myocardial infarction solely from the electrocardiogram must be considered conclusive only when characteristic QRS changes occur in association with transient ST segment abnormalities followed by typical T wave inversion. When a history compatible with myocardial infarction is obtained, the diagnosis may be made on lesser grounds.

The degree to which the standard limb leads will reflect the myocardial changes depends in part on the site of the infarction and in part on the position of the heart. Thus a small antero-septal infarction may not be reflected in the limb leads because the lateral surface of the left ventricle is not involved.

Localization of myocardial infarcts. (1) Antero-septal (Fig. 6). The maximal changes may be seen in V_2 , V_3 or V_4 , with characteristic QS or Q wave abnormalities depending on the degree of involvement of the thickness of the ventricular wall. Elevation of the ST interval followed by T wave inversion usually occurs in leads with QRS changes. Depressed ST and inverted T may occur in the ischemic zone which frequently involves V_5 and V_6 . The disappearance of R in V_2 or V_3 when it is present in the lead to the right is more important than a QS in V_1 , V_2 and V_3 . In the latter case, characteristic ST-T changes are necessary for diagnosis.

(2) Antero-apical. The maximal changes may be seen in V_4 or V_5 with the ischemic zone extending to V_3 and V_6 . The normal progressive increase in the amplitude of R as the electrode is moved across the chest is abruptly altered as the zone of infarction is entered; here a QS or QR complex is found, depending on the degree of involvement of the thickness of the ventricular wall.

(3) Anterolateral. The changes are similar to those of the antero-apical zone, except that the maximal changes are seen in V_6 or V_5 .

(4) Posterolateral. The limb leads are typical of posterior infarction (Q_2 , Q_3 , T_2 , T_3 pattern) but V_6 resembles anterolateral infarction with a significant Q wave and typical ST-T changes. There are no QRS changes in V_1 to V_5 but there may be depressed ST intervals in several of these leads depending on the extent of the infarction. The T waves are upright in V_1 to V_5 .

(5) Posterior (basal) infarction. The changes are similar to those of the posterolateral zone, except that V_6 has no QRS changes.

SUMMARY

1. Unipolar precordial leads are semi-direct leads that explore the anterior ventricular wall, and reflect primarily the electric activity of that portion of the myocardium immediately subjacent to the electrode.

2. Comparison of unipolar leads from the extremities and the precordium allows one to

visualize the electrocardiographic position of the heart. This knowledge aids in the interpretation of many atypical electrocardiographic patterns.

3. The characteristics of the unipolar precordial electrocardiogram in normal adults, in patients with bundle branch block, ventricular hypertrophy, and myocardial infarction, are summarized and illustrated.

4. Multiple precordial leads may reveal or clarify myocardial lesions not defined by standard limb leads or by a single apical precordial lead.

5. The minimum number of precordial leads advisable for routine use has not been determined. At present, positions one to six, inclusive, are advised when the routine four-lead electrocardiogram is not conclusive and a more complete study is required.

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75 PER CENT OF POLIO VICTIMS CAN RECOVER WITHOUT HANDICAP

"Infantile paralysis as a public health menace can be eliminated, scientists are convinced, but not until three basic 'musts' are completed," according to an article appearing in the current issue of *Hygeia*, health magazine of the American Medical Association.

The author—Roland H. Berg, staff member of the National Foundation for Infantile Paralysis—points to the following as the three polio problems:

"The first imposed task is to identify completely the tiny virus causing the disease. Scientists have yet to discover its physical appearance, chemical structure and growth requirements. Given this knowledge, researchers may be able to find the specific chemical, drug, serum, vaccine or antibiotic to halt the virus without injuring the body.

"The second laboratory trial is to unlock the mystery of the nerve cell that acts as a host and sustains the virus. The chemical changes that occur in the routine life processes of this highly important structure must be learned. Scientists must have these facts before they can alter the cell and make it resistant to virus attack without intrinsic injury to the cell itself.

"The third and final laboratory task is to develop a rapid and accurate method of diagnosis or identification of the virus. At present, an acute case of polio is not difficult to diagnose by an experienced physician. Severe clinical symptoms of muscle weakness, pain, stiffness of the neck and back can be recognized by a doctor with sufficient polio training. But recent scientific evidence has disclosed that for every patient with the frank, recognizable symptoms there may be a score or more children and adults with the mild, vague symptoms attributable to other diseases or with no symptoms at all. These persons are a hidden menace in the spread of the disease, for they also excrete the disease producing virus in their nose and throat discharges as well as from their bowels. Certain laboratory diagnosis, at present, can be made only after inoculating monkeys with some of the carefully prepared material collected from the excretions of suspected polio patients. The procedure is painstaking and requires great

skill. Weeks or months must pass before definite results are obtained. Doctors are badly in need of a rapid and accurate means of making a diagnosis. Unless all carriers of the virus can be identified quickly and easily, adequate control methods to halt the spread of poliomyelitis will not be possible."

The author points out that despite some 40 years of research efforts "it is still impossible to prevent the occurrence of an epidemic or even one single case of infantile paralysis.

"The agent that may carry the polio virus and transmit it to human beings has not yet been found," he states. "No tangible evidence has been uncovered to incriminate flies, mosquitoes or animal agents. On occasions scientists have discovered that flies trapped in epidemic areas carry the virus of polio, but they have not been able to link a polio-laden fly with an actual case of human polio. It may be possible for flies or other insects to be incriminated more definitely, but at the present time scientists believe that the disease is more likely passed by intimate person to person contact."

The author states that recently scientists at Stanford University under the direction of Dr. Hubert S. Loring have been about 80 per cent successful in purifying the virus. "They conclude that it is probably protein in character, ranging in size from eight to 20 millimicrons. This is one of the smallest organisms ever studied by man."

Great improvement in treatment has resulted from recent research efforts which demonstrate that virus damage to the spinal cord and brain areas is often only temporary. "Modern methods of care calling for immediate hospitalization and the early and continuous use of physical therapy strive to maintain muscles in as healthy a condition as possible," according to the author. "Because doctors now realize that virus damage to nerve cells need not be permanent, they seek to keep healthy those weakened muscles awaiting the day when normal nerve impulses will once more permit them to act normally. With this philosophy and method of treatment, physicians report that three out of every four cases of infantile paralysis can recover without any handicap."



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EDITORIALS

STREPTOMYCIN

The lack of availability heretofore of streptomycin has been a great disappointment to physicians whose patients seemed in urgent need of this new antibiotic; until less than a year ago the material could only be obtained by a few workers through highly specialized channels. Fortunately it was then possible to work out a mechanism whereby, under the supervision of the Committee on Therapeutics and Other Agents of the National Research Council, moderate amounts of streptomycin were distributed to a series of "responsible investigators" so that patients could be treated under controlled conditions and without cost in order to get a quick and reliable evaluation of what this antibiotic really accomplishes.

These investigators all reported the results of their studies to Dr. Chester Keefer, the Chairman of the Committee, and his report¹ of these pooled observations on 1000 patients represents a landmark in the study of streptomycin which every doctor should study with the greatest attention. Certain points seem definitely settled. First of all here is now a well-established list of the conditions in which streptomycin really is effective: Urinary tract infections due to various gram negative bacilli, bacteremias due to coliform bacilli and *B. Friedlander*, *H. influenzae* infections, tularemia, and meningitis due to coliform bacilli, *B. Friedlander*, *B. Pyocyaneus* and *H. influenzae*. On the other hand it now seems pretty clear that the material is of only questionable value in typhoid fever, Brucellosis and *Salmonella* infections. Malaria, Richettsia infections and virus infections seem not affected at all. The position of tuberculosis is not yet settled but streptomycin has been shown to exercise undoubted beneficial effects in certain experimental tuberculous infections and suggestive palliative results have been obtained in some cases of tuberculosis in man. Large amounts of this expensive material over long periods of time are necessary and much

further study must be done; however, any ray of hope of effective therapy in tuberculosis is encouraging. More details as to indications can be found in the article by Dr. Keefer and his associates referred to above.

Quite recently streptomycin, with certain limitations, has been made available for all doctors—an event of the highest importance. The Civilian Production Administration has now undertaken—as it did with penicillin several years ago—to allocate a monthly allowance of streptomycin to civilian "depot" hospitals which in turn can distribute the material to doctors on proper request. Thirteen hospitals, for example, have been designated in San Francisco and the same number in Los Angeles, as well as hospitals in many other cities in California. When a doctor has a patient who needs streptomycin he will apply to the nearest depot hospital. The hospital in turn, since the supplies are as yet very limited, will probably request information showing that the case is a suitable one for streptomycin treatment. Streptomycin unfortunately is still quite expensive but it is to be hoped that prices will fall and supplies increase in the near future.

It is hard to avoid comparisons between streptomycin and penicillin and it must be admitted that penicillin still stands out on the whole as the more valuable agent. The conditions in which streptomycin is effective are unfortunately limited in number and some of the most brilliant results are had in diseases so rare—such as tularemia—as to constitute no great problem. Unpleasant and sometimes serious reactions—skin rashes, fever, constitutional symptoms and auditory, nerve disturbances—frequently limit the time over which streptomycin can be given to a few days; there is also a tendency for many bacteria to become rapidly resistant to the drug. None the less, streptomycin has clearly come to stay and will be, if not a competitor, at least a valu-

able supplement to penicillin in a number of important infections not influenced by the latter. Doctors should use streptomycin carefully and critically in cases in which the results can be evaluated so that useful information will be ob-

tained and the patients' money will not be wasted.

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New Hospitals—New Methods

Under the recently enacted Hill-Burton Hospital Construction Bill a financial impetus will be given to the construction of new hospital and similar institutions throughout this State. Already 17 hospital districts have been formed and committees are meeting to discuss the most desirable location and size of proposed institutions in those areas. It is assumed that several of these institutions will house private or part-pay patients. Space or space and equipment will be furnished for surgical, radiological, pathological and other medical services. In institutions designed for the bed care of private patients it is to be hoped that plans will be made which will permit private practitioners of medicine to function in the most efficient and ethical manner possible.

In the past, it has been not unusual for hospitals to charge patients only a portion of the actual cost of their bed care. For example, many private hospitals have room or ward charges which cover about 80 per cent of the actual cost of the bed and basic hospital services. The remaining 20 per cent of costs is obtained from various sources, including a portion of the professional income of the radiologists, pathologists, anesthetists, and in some cases, obstetricians and surgeons. The diversion of professional fees toward the support of hospital beds has meant that those patients requiring

such professional services actually pay a larger proportion of the hospital charge than those not requiring them.

Sound economic policy suggests that an effort should be made to finance the beds in hospitals on a true cost basis. If it costs \$7.48 a day to operate a bed in a hospital, that should be the bed charge—and not \$5.50. Then there will not be undue pressure on the hospital administrator to seek additional income from the professional fees of staff and consultant physicians. This will encourage sounder relations on all sides, as well as providing departmental income for improved service.

It is perfectly simple and ethical for physicians such as radiologists and pathologists to rent space or space and equipment in the hospital and to furnish excellent medical care on a full professional basis. The details of such contractual arrangements have been published in journals devoted to hospital management as well as in journals pertaining to the specialties involved. The medical profession must feel that this first big expansion of medical care facilities may well set a precedent for future medical policies on a federal basis. It will welcome all sound developments in the hospital field, especially in those tending to perfect the relationship between hospitals and physicians.

FOLIC ACID

The brightest new star to flash across the horizon of medical therapeutics is that of folic acid. In the short space of six years the status of this substance has progressed from an unidentified deficiency to isolation, synthesis and successful application in the therapy of the macrocytic anemia of pernicious anemia, sprue, nutritional anemia, pernicious anemia of pregnancy and megaloblastic anemia of infancy. This phenomenal progress has been made possible by the combined efforts of a number of different groups of investigators, sometimes working in fields which appeared unrelated.

A group of substances widely distributed in natural products, including liver, yeast and spinach, were observed to supply deficiencies in growth or hematopoiesis in animals. They were referred to as Vitamin M, folic acid, lactobacillus

casei factor and streptococcus fecalis R factor, depending on the source of the material and the species of organism used for test purposes (chicks, monkeys, rats, fish and *L. casei*). The various forms of this dietary factor differed in their activity toward different test objects in their ability to substitute for the deficiency. Folic acid was considered to be a factor in liver which possessed hematopoietic activity and was essential for the growth of *L. casei*. A closely related compound was found in fermentation products. During the past year two cooperating groups of workers^{1,2} have announced the isolation and the synthesis of the liver *L. casei* factor. The structural formula established for this substance is $N - [4 - \{ (2 - \text{amino} - 4 \text{ hydroxy} - 6 - \text{pteridyl}) \text{ methyl} \} \text{ amino} \} \text{ benzoyl}] \text{ glutamic acid}$. As an abbreviated designation the name pteroylglutamic acid was proposed. The same authors likewise

synthesized closely related compounds which appeared identical with the L. casei factor from fermentation products and with the streptococcus faecalis R factor.

Several publications have appeared dealing with the clinical applications of synthetic folic acid (liver L. casei factor). It is an effective agent in the treatment of macrocytic anemias,^{3,4,5,7} including Addisonian anemia, nutritional macrocytic anemia, pernicious anemia of pregnancy, sprue, and megaloblastic anemia of infancy. The hemotopoietic response is characterized by an increase in reticulocytes, erythrocytes, leukocytes, platelets, normoblasts and hemoglobin and by a decrease in the megoloblasts in the bone marrow.

In sprue³ the results have been dramatic. Within three days after the institution of therapy there is an improved sense of well being, soon followed by relief of the glossitis, cessation of the diarrhea, increase in appetite and weight and return to a normal type of sugar tolerance curve. The similarity of response in "tropical" and "non-tropical" sprue furnishes incidental evidence of the essential identity of these two conditions. It seems likely that both represent the syndrome of folic acid deficiency.

Aplastic anemias, iron deficiency anemia, the anemia associated with leukemia and the leukopenia following sulfonamides and radiation therapy of malignant disease⁶ have been refractory to folic acid.

The dosage has been experimental to date and has varied from 15 to 200 mg. per day. The average optimum dose will probably be found somewhere around the lower end of this scale. Administration is either oral or parenteral.

The existence of a compound in liver, other than that of the still not isolated liver antianemia principle contained in Cohn's fraction G, yet possessing hematopoietic activity in macrocytic anemia, arouses much speculation with regard to the relationship of these substances. The poor results in the treatment of combined system disease obtained with synthetic folic acid suggest that liver extract will continue to be preferable in the therapy of Addisonian anemia unless the patient is sensitive to it. Likewise the excellent response obtained with folic acid in sprue and nutritional anemia make it the treatment of choice.

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U. C. MAN OFFERS NEW NERVE DISEASE THEORY

A new theory to explain a nerve condition in which there is derangement of movements of the eyeballs, lids and facial muscles has been offered by Dr. Robert Wartenberg, associate professor of neurology in the University of California Medical School.

The loss of coordination of muscles usually follows injury, surgery, or disease, to the nerve controlling movement of the eyeballs or of the facial muscles.

In this condition the victim finds when looking straight ahead that one eyelid refuses to open; but it opens when he looks to the side; or if he closes his eye he cannot help screwing up his face in an odd manner.

Eminent neurologists long since have agreed generally

that the condition is caused by nerve fibers going astray as they grow forward after injury, arriving at muscles to which they do not belong and thereby upsetting normal muscle coordination.

Dr. Wartenberg presents a host of arguments refuting this theory, and suggests that the derangement is caused by a sort of "chain reaction" in which the root of the nerve in the brain stem is affected.

The neurologist suggests that damage to the nerves at some point between the brain and the eyes or face causes the nerve to be affected not only at that point but also at its base in the brain. This sets off a release mechanism which results in the loss of control by the nerve of movement of the eyes and lids and of other facial muscles.



Clinical-Pathological Conference*

Case history: A man aged 29 years enjoyed good health until three months previously, at which time he had a severe sore throat lasting two weeks. He denied having had rheumatic fever, scarlet fever or nephritis. About one week after recovery from the sore throat, he complained of abdominal cramps with nausea, slight fever and weakness. He had lost eight pounds in weight. The blood pressure was 125/82 gradually increasing to 200/110. The temperature varied in the next few days; it was low in the morning and reached a peak between 4 P.M. and 8 P.M.; the highest recorded temperature was 40.5°C. A questionable mass was palpable in the right upper abdomen. Urinalyses were constantly positive for albumin, leucocytes and erythrocytes; occasionally gross blood and granular casts were present.

Physical examination: On admission to the hospital, the temperature was 36.5, pulse 118, respiration 22, blood pressure 184/34. The skin was pale and doughy. There were ecchymoses over both ankles, and edema of the optic discs and obscuration of the retinal vessels. The vessels were small and spastic. There were early cotton-wool exudates in each eye between arterial forks, and occasional striate hemorrhages in retinas.

Laboratory Examinations: X-Ray of chest revealed heart and lungs to be within normal limits. Electrocardiograms revealed occasional premature ventricular systoles and left axis deviation and changes suggestive of myocardial involvement. A series of urinalyses consistently revealed albumin, many RBC and WBC and occasional granular casts and a specific gravity varying from 1.005 to 1.026. Blood chemistry on admission: NPN-92 mg., Creatinine 2.9 mg. Subsequent studies showed a gradual decrease and the final reports were NPN-28 mg., Creatinine 1 mg. The blood counts revealed a progressive anemia and leucocytosis. The highest leucocyte count recorded was 37,800 with 81% neutrophils and 19% lymphocytes. The last blood count (two days before death) showed 17,900 leucocytes with 85% neutrophils and 15% lymphocytes. Blood protein was consistently below normal with constant albumin-globulin reversal.

Course: The patient was fairly comfortable with relatively no complaints except failing vision. His blood pressure varied considerably, on several occasions the blood pressure was within normal range, but as a rule, it remained near 184/134. The day before death it was 190/120. There developed a systolic murmur over the mitral area which would disappear at times. A gallop rhythm was also noted and there was evidence of enlargement of the left ventricle, but

at no time did he reveal acute evidences of cardiac insufficiency.

Three days before death he complained of a sudden appearance of severe pain in the right flank and on examination slight resistance to palpation and a slight mass were palpable in this area. He was given an injection of Depropanex with slight relief of pain. The following day pain was complained of in the left flank. Tenderness was elicited in this area but no mass was palpable. The pain in the right kidney area was attributed to the passage of blood clots since gross blood was noted in the urine. Two days later the patient suddenly expired.

Clinician's discussion: The diagnosis in this patient must explain a fulminating renal lesion with marked albuminuria, hematuria, casts, and a suddenly developed hypertension. This was followed by rapid rise of NPN and Creatinine in the blood, and by progressive changes in the eye grounds with edema and exudate. Apparently a rapid throttling down of circulation through the glomerulus was occurring. The heart enlarged and a systolic murmur developed at the mitral area. The EGG patterns were interpreted as showing "myocardial involvement" but no description of the graphic pattern is given aside from the presence of ventricular premature beats and the presence of left axis deviation. One would like to know the character and serial behavior of the T waves. Fever, leucocytosis, and pain in the right flank developed, followed by gross hematuria, at which time a tender mass was felt in the right upper abdominal quadrant. Death occurred suddenly, less than three months after the onset of his symptoms.

The explanations of the degenerative or inflammatory lesion in the kidney capable of producing such fulminating and quickly fatal results offer problems. The clinical picture certainly does not fit the ordinary natural history of acute diffuse glomerulo-nephritis in which death is an exceptional outcome.

The rapid development of hypertension, azotemia, and retinal changes are evidence of a process both fulminating and diffuse.

Fishberg describes this type of nephritis as due to inflammatory and necrotizing lesions of the vas afferens of the glomerulus. All of his patients with this type of lesions died from renal insufficiency.

More recently reports have appeared in which marked cardiac signs and symptoms have been pointed out as occurring with acute diffuse glomerulo-nephritis. In several of these, postmortem examination has shown acute arteriolitis diffusely scattered in the bodily tissues. They seem to con-

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form in many ways to what we regard as periarteritis nodosa, or polyarteritis nodosa with fulminating renal and cardiac symptoms.

Whether ordinary acute glomerulo-nephritis is a distinct entity, and this other type of disease due to necrotizing arteriolitis is another, or whether they represent different degrees of response to a common etiologic agent, we do not know. It is interesting, however, that many workers are regarding the pathogenesis of ordinary acute diffuse glomerulo-nephritis as due to an allergic mechanism, and this is perhaps the view of the majority of observers in regard to the pathogenesis of polyarteritis.

A good guess, therefore, is that the diffuse nephritis in these cases is due to necrotizing arteriolitis and that there is probably a diffuse arteritis throughout the body. Polyarteritis probably always should be thought of in a young male with fever, leucocytosis, anorexia, hypertension, and a number of apparently unrelated data. This disease has protean manifestations and should be suspected in any acute sepsis with bizarre symptoms not explainable by a single diagnosis.

Fever, leucocytosis, albuminuria, abdominal pain, hypertension and hematuria are found in about half of the cases which have been reported. Pain in the flanks accompanying hematuria usually indicates renal infarction of perirenal hemorrhage. Renal insufficiency with uremia often terminates life.

This is a difficult diagnosis to prove, save by necropsy. Superficial periarterial nodules from which the original name periarteritis nodosa was derived are not common, and are found in less than one-fourth of the cases. They were not mentioned in the case under consideration. A tentative diagnosis based upon clinical data, however, cannot be refuted by negative biopsy findings. The value of the biopsy rests in the few instances where the suspected diagnosis is confirmed. Even with confirmation, the treatment is non-specific as the etiology is obscure. Regarded as a sensitization response to drugs, serums or infection, the condition is little influenced by treatment. Apparent cures have occurred with such diverse agents that their relationship to cure is not too impressive.

Autopsy findings: The principle lesions found grossly involved the kidneys, heart and intestinal tract.

The right kidney formed a part of a large globular mass occupying the right loin. The bulk of the mass was a large hematoma, the peripheral third of which was clotted, the central two-thirds composed of fluid blood. The hematoma resulted from the rupture of an aneurysmal sac which occupied the kidney parenchyma just above the center on the anterior surface. In the kidney the hematoma was walled off by a thick whitish membrane and the clot was laminated except at the center where it was semi-fluid. The lesion was a pseudo aneurysm of a small intrarenal artery, the main renal vessels as traced from aorta to hilus

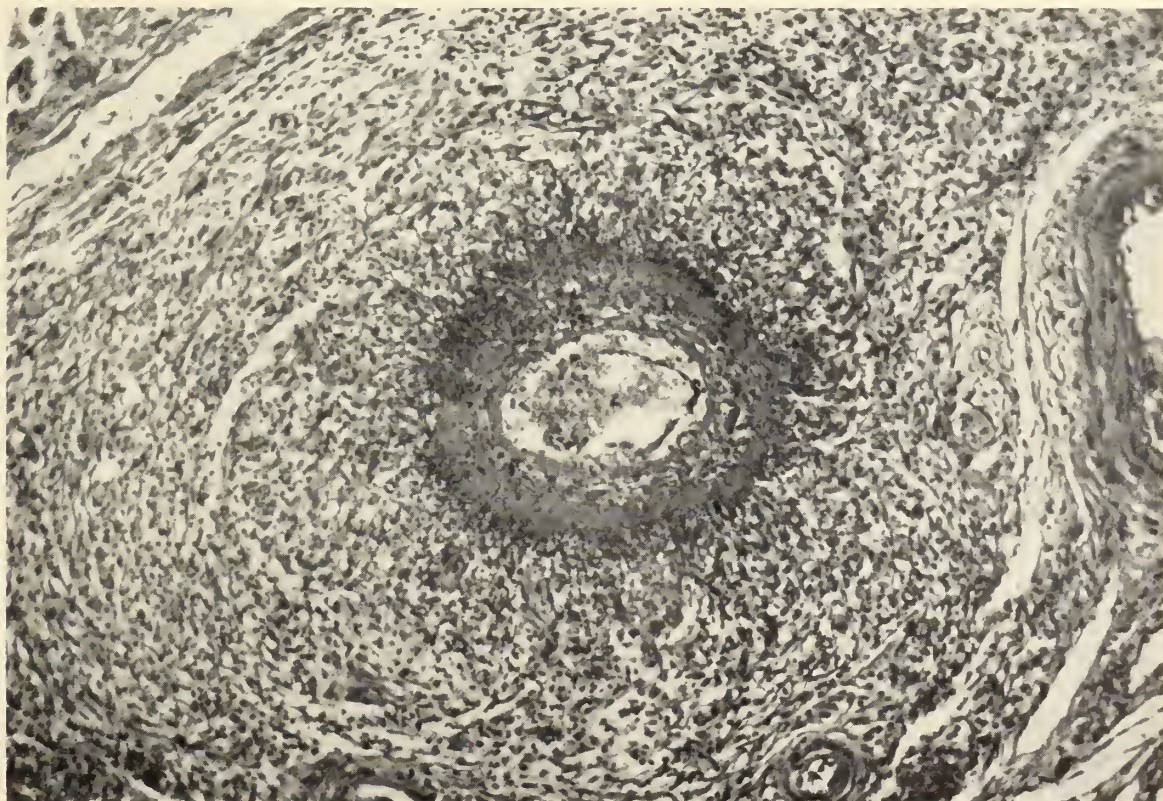


Figure 1.

were normal. In addition several smaller aneurysms were seen in the kidney parenchyma as well as several small infarcts. The left kidney also contained small aneurysms and infarcts.

The heart was enlarged with moderate hypertrophy of the left ventricle. There was an irregular white scar in the posterior part of the septum. The coronary vessels appeared normal.

In the stomach there were numerous small red erosions. In the jejunum there were visible and palpable ten reddish masses within folds of mucosa. In the cecum, ascending colon and transverse colon there were innumerable reddish irregular erosions beneath which the submucosa was slightly thickened and indurated.

Microscopic examination revealed polyarteritis nodosa as the basis of the gross lesions. The renal aneurysms were pseudo-aneurysms resulting from rupture of weakened vessel walls with hemorrhage into the parenchyma. The distribution of the involved vessels was very erratic as noted in the gastro-intestinal tract. Most organs contained at least a few involved vessels even though their presence was not suspected grossly; however, there were no typical lesions in the skeletal muscles or skin. The accompanying photomicrograph (Figure 1) is of a vessel from the periadrenal fat. In this vessel the lumen contains fibrin and red cells. Many of the intimal cells are detached. The inner portion of the muscularis is necrotic. The remainder of the muscle is lost in an infiltrating mass of polymorphonuclears, lymphocytes,

phagocytes and fibroblasts which extend into the adventitia and out into the surrounding tissue.

Pathologist's discussion: It is not so surprising that polyarteritis nodosa with massive involvement of the kidney masqueraded as an acute glomerular nephritis but it is remarkable that a patient with almost universal vascular lesions exhibited no other manifestations of the disease. In retrospect, no single point stands out to suggest the true character of the disease although the progressive eyeground changes and stationary hypertension in the face of decreasing azotemia and unfixed specific gravity of urine, might have suggested that this was an unusual case of glomerular nephritis. Even had muscle biopsy been resorted to, the chances were against a typical lesion being found.

The case gives no assistance in determining the etiology of this disease although two possible etiologic agents were mentioned in the history: (a) sore throat, and (b) sulfa therapy. The proponents of sensitivity to streptococci as the basis of this vascular syndrome would point to the acute upper respiratory infection as the sensitizing factor. Those who believe that the lesion is a manifestation of sensitivity to sulfa drugs would point to the fact that large amounts of these drugs were given on both admissions. The reason for the sudden death of this patient was not found, a circumstance frequently noted before in the disease and usually attributed to sudden spasm of the vessels of the brain and heart.

X-RAY SHOW UNBORN CHILD OF 12 WEEKS BREATHE, SWALLOWS

Two Chicago doctors have demonstrated by means of a dye and x-rays that the important functions of breathing and swallowing develop as early as the 12th week in an unborn child.

Writing in the August 10 issue of *The Journal of the American Medical Association*, the authors—M. Edward Davis and Edith L. Potter from the Department of Obstetrics and Gynecology, the University of Chicago School of Medicine and the Chicago Lying-in Hospital—state that these experiments were carried out on two groups of patients: one made up of 16 women, who, because of some serious maternal complication, had to have their pregnancy terminated in the first half of the period and the second consisted of 10 women who were delivered by a cesarean operation.

The dye, opaque to x-rays, was injected into the sac containing the fetus. From 17 to 52 hours later the pregnancy was terminated and the fetus was sent to the x-ray laboratory. The first group of fetuses showed the dye in all parts of the lungs, in the stomach and throughout the

intestinal tract, demonstrating that the fetus aspirated the fluid within the sac and exhaled it. Thus there is evidence that the fluid normally moves in and out of the lungs.

The second series of patients, who were delivered by cesarean operation, were treated in the same manner. X-ray examination of the infants' lungs immediately after delivery showed evidence of the dye in five, probable presence in two and no definite evidence in three.

The authors point out that the "general pattern of respiratory activity is developed very early in fetal life." During this period the respiratory movements are intermittent, irregular and shallow. "At birth air is substituted for fluid, and respirations become deeper, regular and continuous, but the pattern remains the same. The major change involves the substitution of air for fluid as a medium of exchange."

In conclusion, Drs. Davis and Potter state that "fetal swallowing and complete gastrointestinal activity has been demonstrated for the first time in a human fetus [12 weeks old] weighing 39 grams."



CLINICAL CONFERENCE

The Treatment of Subacute Bacterial Endocarditis

UNIVERSITY OF CALIFORNIA HOSPITAL STAFF CONFERENCE, OCTOBER 2, 1946

CASE presentation, *Dr. Herbert Moffitt, Jr.: A 65-year-old white machinist was admitted on June 20, 1946. Since May, 1945, patient had had intermittent episodes of chills, fever, sweating, malaise, and anorexia associated with anemia and thirty pound weight loss. He has been hospitalized elsewhere on eight occasions and treated with penicillin and transfusions with resultant relief of symptoms for two or three weeks. In March, 1946, blood culture was reported positive for streptococcus viridans for the first time. In April, 1946, he had an episode of acute pulmonary edema. There had been no evident embolic phenomena. There was no history of rheumatic fever although a murmur had been noted twelve years before entry when he was granted an insurance policy.

Examination at entry on June 20, 1946, revealed the following positive findings: (1) Erythematous macular rash over trunk and arms; (2) Petechial hemorrhages on right hand (three) and left foot (two). (3) Loud, harsh, widely-transmitted apical systolic murmur without thrill or cardiac enlargement. (4) Splenomegaly two finger-breadths below costal margin. (5) A rectal polyp 10 cm. above the sphincter.

Significant laboratory findings at time of admission included: Hgb.: 92 per cent, RBC: 4.04 million, WBC: 7,600 with normal differential, CSR: 36 mm./hr. Urine gravity 1.023; albumin 3 plus; 5 WBC and 5 RBC per HPF; hyaline and granular casts. Chest x-ray and EKG were consistent with left auricular enlargement. Circulation time, venous pressure, and vital capacity were normal. Biopsy showed the rectal polyp to be a malignant papilloma; it was excised and the base was cauterized.

During the first week of hospitalization, fever spiked to 40.7 with chills; five blood cultures were positive for streptococcus viridans; the organism was sensitive to 0.01 units penicillin per cc. During the second week the patient was given 400,000-500,000 units of penicillin daily by continuous intramuscular drip with a resultant blood level of 0.31 units/cc. Dosage was increased to 1,500,000 units daily during the last week of July and continued in this dosage in spite of low grade fever and occasional spikes to 38.6 until August 26, when continuous penicillin was discontinued, after a total dosage of 68,300,000 units. On September 3, 30cc. of pus was evacuated from an abscess at the site of previous catheterization in the right lateral thigh but this pus was not cultured. During

hospitalization, patient was given three transfusions; he had an episode of acute pulmonary edema following the last transfusion but this cleared in six hours of treatment with oxygen, morphine, and aminophyllin. He had been previously digitalized.

The patient was discharged on September 12, after being afebrile and symptom free 19 days after the cessation of specific therapy. At time of discharge, all blood cultures had been negative for two months, Hgb was 80 per cent, RBC 4.08 million, WBC 7,800, CSR 27 mm./hr. Urine showed 1 plus albumin, few WBC, rare granular cast.

*Dr. Kerr: I am asking Dr. Rantz to open the discussion and will ask him and the other discussants to bring out the following points:

1. What is the best method of administration of penicillin?
2. What is the validity of the penicillin blood level and the sensitivity of the organism as indices of penicillin dosage? How much can we rely on sensitivity and blood levels so as not to waste the drug?
3. What is the proper dosage and how often, how much and how long?
4. What are the criteria for cure?

**Dr. Rantz: The manner of administration and the duration of therapy in the group treated here and that at Stanford Hospitals is really quite different. I cannot attempt to answer all of Dr. Kerr's questions this morning. There are many variables in the treatment of this disease. The total duration of the therapy was kept constant in our patients who received therapy for 60 days. If the patient needed more treatment, another course of 60 days was given. We also control the factor of route of administration by using three hour intermittent intramuscular therapy which may, on the whole, be more satisfactory than continuous therapy. There is no way to settle this. With intermittent therapy we have treated patients with smaller daily doses than the California group has been required to use.

We have studied 32 patients at Stanford, 20 of whom received 300,000 units per day for 60 days. In all the strain of streptococcus was inhibited by .05 units per cc. of penicillin; all were bacteriologically cured. In the beginning when patients were first admitted to the clinic it was impossible to increase the daily dose of penicillin. As more

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of the drug became available, we began to use more and more in certain cases. We have several patients who have had more than one course of penicillin. We have estimated the daily dose as 1,000,000 units for each tenth of a unit of sensitivity to the organism. Nine cases have recovered in which more than 1,000,000 units per day were given. One case was of some interest and raises another point of great importance which was not appreciated previously. This is the matter of renal function.

Many blood level determinations have not been done but we have been interested in excretion of penicillin studies carried out in this patient, which demonstrated that he cleared only 125 cc. of blood per minute of penicillin instead of the normal 600 or 700 cc. His blood levels were, therefore, several times higher than would be expected in a normal person. A cure was obtained with a dose of 12,000,000 units per day although his organism required 5.0 units per cc. of penicillin for complete inhibition *in vitro*.

It is possible to predict dosage on the basis of sensitivity with some accuracy, but there is a tendency to use larger amounts of penicillin even though we know that cure may be usually obtained with smaller dosage. We feel that the most reliable sign is a sterile blood culture. No other clinical or laboratory criteria for cure are very helpful. To determine if the disease is arrested, it is necessary to carry out an adequate course of therapy, withdraw the drug, and follow the patient clinically and with blood cultures.

†Dr. Brown: Subacute bacterial endocarditis is a complicated disease. We cannot approach it as a simple infection for which we can plan routine methods of treatment. Heart damage is always present and is even more extensive after treatment when the infecting organisms have been eliminated and the valves have healed. Many patients will develop congestive failure from which they will succumb. In spite of present methods of therapy the disease remains extremely serious and we should approach the problem with humility. Up to about a year ago recovery rates were estimated at little better than 40 per cent. Now more patients are being cured of the infection. Theoretically all patients with subacute bacterial endocarditis due to penicillin sensitive organisms should be cured of the infection. Heart damage then remains. However, many recovered patients live useful lives and the ultimate prognosis of any patient is difficult to predict so that all should be regarded with optimism.

Since treatment is antibacterial in nature, the infecting organism and its sensitivity to penicillin is of first importance and must be determined at the outset. The alpha hemolytic streptococcus (*streptococcus viridans*) is the cause in the vast majority of patients. Fortunately most strains are

relatively sensitive to penicillin. Strains of streptococcus faecalis are perhaps next most frequent. These are in general less sensitive and must be differentiated from strept. viridans. Almost all pathogenic organisms are capable of causing subacute bacterial endocarditis in rare instances. It is obviously of the greatest importance for treatment and an evaluation of prognosis to promptly determine the nature and characteristics of the infecting organism in any case.

A consideration of the best method of administration of penicillin raises differences of opinion. We have preferred the continuous intramuscular injection method for several reasons. It seemed easier on the patient to have a soft catheter continuously in the muscle with an infusion bottle attached than to receive repeated injections over many weeks. Most patients agree. It also seemed more convenient for the ward staff. Finally it has been our opinion that the maintenance of a continuous effective blood level was more rational than to obtain intermittent peaks; this last is controversial as mentioned before. Other methods of administration such as the oral, intravenous, etc., have drawbacks which make them less desirable than the intramuscular route.

The criteria for cure of subacute bacterial endocarditis are difficult to determine. Obviously if the blood culture remains positive the infection is still active. However, if the blood culture is negative, infection on the heart valve may still be present and become active when penicillin is stopped. Fever, embolic phenomena and elevated sedimentation rate may continue for a short time even though recovery has taken place and are therefore not reliable as guides to continuing infection. We hope to develop tests which will indicate when infection has been eliminated. Since patients with subacute bacterial endocarditis have significant amounts of antibody in their blood against the infecting organism and normal people do not, measurement of this level might be a guide. Supposedly, after cure these antibodies will disappear. We have employed precipitin tests to measure antibodies against the alpha hemolytic streptococcus. To date all patients have had antibodies but they have remained during treatment. These immune bodies will probably not disappear for several weeks and so such measurements can constitute only a late guide to cure.

*Dr. Friedlander: Two of four patients recently seen developed subacute bacterial endocarditis following dental extractions. We should be able to give penicillin in adequate prophylactic dosage to patients who have heart disease and who must undergo oral surgery.

Dr. Kerr: This prophylactic measure might be used in other types of surgery, also. Some patients have been treated for long periods of time. Observations have been made which indicate that

†Dr. John W. Brown, Assistant Professor of Medicine, University of California Medical School.

*Dr. Richard D. Friedlander, Assistant Clinical Professor of Medicine, University of California Medical School.

when one uses an antibiotic like penicillin which eliminates certain organisms, other organisms may grow. It has been suggested that large doses

of penicillin given by mouth may cause the development of such a condition as the brown tongue associated with monilia.

PENICILLIN SPRAY ECONOMIC WAY TO TREAT RESPIRATORY DISEASES

Inhaling penicillin spray is more economical and effective for infections of the respiratory tract than injecting of the respiratory tract than injecting the drug into the veins or muscles, according to the latest report appearing in the October 5 issue of *The Journal of the American Medical Association*.

Frank W. Morse, M.D., of Lawrencetown, Nova Scotia, says that by this treatment penicillin is placed at the site of infection and has not only a strong local effect but it is absorbed into the blood stream and aids the natural body defenses to overcome the condition. Moreover, "it also has a definite local soothing effect which relieves such discomfort as soreness in the throat, painful, frequent coughing and the sensation of dryness in the mucous membranes."

The author maintains that the "penicillin seems to act in a more efficient manner when given by spray than by injection. It is common to give 160,000 units daily by the intramuscular route in pneumonia, whereas in treatment of one case of pneumonia in this series 40,000 units was given daily for four days, a total dosage of 160,000 units in all. In other words, the total dose in this case treated by spray would supply only one day's dose if given intramuscularly. This saving of penicillin is apparently due to the fact, that, first, the greatest concentration of penicillin is directly on the infected site, the air sacs, and secondly, it is absorbed into the blood stream and thus has a systemic effect as well."

Most of the 25 patients who were treated by this physician were infected during the influenza epidemic which began in this locality about January 3, 1946. There were only two failures in this series, due to the uncooperativeness of the patients.

Penicillin spray is produced by a hand-operated bulb atomizer. The patient inhales and then holds his breath allowing the suspended penicillin to settle on the infected mucous membranes.

Personally convinced of the advantages of penicillin spray, the author summarizes them as follows:

1. The absence of toxicity in contrast to that of the sulfonamides.
2. The absence of dangers due to untrained personnel using the intramuscular route of administration.
3. The ease of transporting and caring for the materials, the atomizer and penicillin.
4. The availability of materials. Atomizers can be easily obtained and are cheap. Penicillin spray can be purchased at a small cost.
5. Painless administration. This is an important factor in nervous or young patients.
6. The saving of penicillin.
7. The remarkably soothing local effect of penicillin spray in addition to its therapeutic effectiveness.
8. The pleasant taste of penicillin.
9. The absorption of inhaled penicillin. The fact that inhaled penicillin spray is absorbed and can attain an effective level in the blood suggests that perhaps sites of infection other than those in the respiratory tract may be treated in this manner.

An editorial in the same issue of *The Journal* states that penicillin spray is probably the simplest technique thus far employed for the treatment of respiratory conditions. "The results recorded are encouraging," it says, adding: "However, much more needs to be done on the subject of penicillin administration by inhalation before this procedure can be considered of established scientific merit. Controlled studies are necessary. Large enough numbers of patients with a single respiratory disease need to be studied and compared with similar groups treated without penicillin and with penicillin administered by the usual intramuscular route. Comparative studies should be made on the value and accuracy of the various types of nebulizers and on their effectiveness in delivering the penicillin where it will do the most good. Important also are careful studies on the optimum dosage of penicillin when given by spray, the preferred frequency of administration and the most desirable medium for dissolving the penicillin."



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LEWIS A. ALESEN, M.D.....	Vice-Speaker	DWIGHT L. WILBUR, M.D.....	Editor
JOHN HUNTON.....		Executive Secretary	

FOR COMPLETE ROSTER OF OFFICERS, SEE ADVERTISING PAGE 4

NOTICES AND REPORTS

California Physicians' Service—Record-Keeping

California Physicians' Service had an enrollment of 272,440 beneficiary members as of September 1 this year an increase of more than 115,000 during the past 12 months. Enrollment figures for September are not yet available as this is written, but at the present rate membership will exceed 300,000 within two months and should be approaching the half million mark within the next six to eight months.

Interest shown by the general public in the C.P.S. prepaid medical care program is gratifying to the board of trustees and the administration. It is felt that the quickened interest is the result of several factors, salient among them being the splendid public relations program being carried by the California Medical Association. Most important of all is that the medical profession of California is demonstrating to the public that it is sincerely and efficiently providing a prepaid medical service plan to people in the lower income brackets.

The rapid increase in C.P.S. membership has presented many problems to the administration, which has been handicapped by lack of trained personnel and office space. These handicaps are being overcome as rapidly as possible. Experience shows that rapid enrollment always is followed by a high percentage of utilization of the surgical contract for the first few months. This necessitates constant and careful study by the medical department to keep C.P.S. policies on a sound actuarial basis. In this important department C.P.S. has 66 employees in Los Angeles and 51 in San Francisco handling the commercial and veterans' programs.

Probably only a few physicians realize the important role the medical department plays in keeping C.P.S. on an even keel.

Each day thousands of punch cards speed through the IBM machines. From the carded cryptics comes a report on the activity of thousands of physicians . . . a report on the thousands of beneficiary members of C.P.S. . . . a report on the cost of, say, Case No. 549.

Did you know that some 10,500 beneficiary members each month are under the care of physicians scattered throughout the State of California? That out of every 1,000 members 30 to 35 will seek treatment in physicians' offices each month? That there will be approximately two and one-half bills per patient?

Our machine records tell us this. And more. That over 25,000 bills per month must be individually priced and coded.

C.P.S. has long since learned that there is a general pattern of the practice of medicine in this state which is almost mathematically predictable. For this reason, it has abandoned the time-worn procedure that characterizes

other medical service plans, where an initial report must be submitted and authorization be granted to perform certain procedures for certain types of illnesses.

Under the C.P.S. procedure, the patient's identification card is an immediate authorization for treatment. It is only necessary for the physician to submit to C.P.S. at the end of each month his bill for the services rendered.

When this bill is received in the C.P.S. offices it is checked with what is known as the "Positive Identification Section." This section has listed all the members and their status. The lists show whether or not their dues have been paid and the type of contracts that they hold. After the eligibility has been determined, a case that has never had service under C.P.S. becomes a patient, and a medical folder is made up in which the present treatment and all future treatments will be filed together. If the patient has been under care previously, his medical record is pulled from the file and the case is studied in relation to the medical care that has been rendered.

The bills are then sent to the Medical Department, where they are priced according to the C.P.S. Fee Schedule. At this point the cases are carefully studied to determine benefits—whether or not the chronic condition clause has run out, whether or not the patient has had one year's care for a particular illness, and many other factors that relate to the contract provisions. After this has been determined, each individual case ends up in a series of code numbers. Before each price there is an abbreviated diagnostic code of some 1,000 items. This code was taken from the United States Public Health Morbidity Code, and was specifically designed for use in prepaid medical care plans. It has only been developed since 1940. Thus each illness that is being seen ends up with a code number. For instance, appendicitis becomes No. 549. If it happens to be a perforation of the appendix, it becomes No. 540.

For each case of illness a case number is assigned, so that all costs relative to the particular case may be gathered together and eventually C.P.S. may determine the cost per case. The cost per case may involve the surgeon's services, an assistant and anesthetist, certain laboratory work; and for hospitalization will include so many days in the hospital, plus operating room costs.

After these facts are determined, one further step is developed, to determine just what has been done to care for any particular illness. Thus, if an appendectomy had been performed for appendicitis, the code number 222 would be assigned, and for the assistant's services there would be the code number 194. Any other services that were performed would be assigned the proper procedure number.

From this it can be seen that C.P.S. is in a position to know exactly how many cases of illness are treated in a month, the type of illnesses, what was done for any particular illness, and the cost per case. All this information is transferred as a permanent record onto the International Business Machine punch cards. At the end of each month a standard report of the number of kinds of illnesses treated and their costs is presented to the executives of C.P.S. for study. For example, in the month of March of 1946, the record shows that 7,723 cases of illness were reported. It also shows that of this number, 209 were cases of appendicitis, 123 hernias repaired, 90 live births and 608 tonsillectomies. There was \$235,710.44 expended in this month for services, distributed according to the following table:

TOTAL DUES.....		\$276,592.40
MEDICAL COSTS.....	\$ 56,229.97	
Attending Physicians..	\$ 33,719.20	
Assistants and		
Consultants	468.68	
Anesthetists	10.32	
X-ray and Radium...	12,608.49	
Laboratory and Misc..	9,423.28	
SURGICAL COSTS.....	149,204.08	
Attending Physicians..	111,623.44	
Assistants and		
Consultants	7,162.22	
Anesthetists	11,461.23	
X-ray and Radium...	11,253.50	
Laboratory and Misc..	7,703.69	
C.P.S. HOSPITAL COSTS..	30,276.39	
Ward Care	23,368.15	
Operating and		
Delivery Room	6,908.24	
TOTAL SERVICE COSTS...		\$235,710.44

The handling of 25,000 bills each month has been developed efficiently, the result of many years of experimentation. C.P.S.'s pattern of getting statistical material and its method of paying bills have been studied by numerous investigators such as the Rockefeller Foundation, the California Assembly Interim Committee, the Senate Interim Committee and others.

The tremendous amount of material classified by our record-keeping system has been pronounced the most complete collection of information on prepaid medical care that exists in this country.

Untold possibilities in this field await our continuing studies.

In Memoriam

Alpert, Clarence Darrow. Died at Los Angeles, March 20, 1946, age 40. Graduate of Northwestern University Medical School, Chicago, Illinois, 1938. Licensed in California in 1938. Doctor Alpert was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

Baker, Robert Vivian. Died at Napa, August 25, 1946, age 52. Graduate of Rush Medical College, Illinois, 1922. Licensed in California in 1922. Doctor Baker was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

Blecker, Ralph Franklin. Died at Fresno, August 14, 1946, age 42. Graduate of the University of Nebraska College of Medicine, Omaha, 1927. Licensed in California in 1927. Doctor Blecker was a member of the

Fresno County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Brownlie, James William. Died at San Francisco, June 26, 1946, age 62. Graduate of Cooper Medical College, San Francisco, 1908. Licensed in California in 1909. Doctor Brownlie was a member of the Solano County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Clark, Milton Francis. Died at Cloverdale, August 13, 1946, age 63. Graduate of Cooper Medical College, San Francisco, 1910. Licensed in California in 1911. Doctor Clark was a member of the Sonoma County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Eklund, Oscar Eric. Died at San Francisco, June 7, 1946, age 68. Graduate of the College of Physicians and Surgeons of San Francisco, 1902. Licensed in California in 1904. Doctor Eklund was a Retired Member of the San Francisco County Medical Society, the California Medical Association, and an Affiliate Fellow of the American Medical Association.

Finch, Arthur Alexander. Died at Pasadena, June 9, 1946, age 74. Graduate of the Hahnemann Medical College of the Pacific, San Francisco, 1892. Licensed in California in 1892. Doctor Finch was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

Gundry, Frank Joseph. Died at Rochester, Minnesota, June 18, 1946, age 69. Graduate of Cooper Medical College, San Francisco, 1906. Licensed in California in 1906. Doctor Gundry was a member of the Kern County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Hull, John Franklin. Died at Alhambra, June 13, 1946, age 70. Graduate of the State University of Iowa College of Medicine, Iowa City, 1898. Licensed in California in 1916. Doctor Hull was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

Miller, Lena Augusta Geraldson. Died at Napa, August 14, 1946, age 74. Graduate of the Cooper Medical College, San Francisco, 1903. Licensed in California in 1903. Doctor Miller was a member of the Napa County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Tebbe, Frederick Henry. Died at Oakland, June 27, 1946, age 75. Graduate of the University of California Medical School, Berkeley-San Francisco, 1902. Licensed in California in 1902. Doctor Tebbe was a member of the Alameda County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

NEWS and NOTES

NATIONAL • STATE • COUNTY

COLUSA COUNTY

In the hope of overcoming a dearth of doctors in Colusa County, William S. Randall, president of the Colusa Chamber of Commerce, has been authorized to appoint a committee to confer with the Board of Supervisors and other agencies interested in increasing medical service. War and the lure of more lucrative fields of endeavor, has left Colusa with only four medical men, one of them superintendent and surgical head of one of the units of the County Hospital and County Health Unit.

FRESNO

Dr. H. C. Habegger, now in the Indian service at Schurz, Nevada, plans to move into the newly remodeled medical building adjoining the Reedley Hospital, sometime in October or November.

LOS ANGELES

Dr. Ben G. Gurman has opened an office for the practice of medicine and surgery at 306 South First Avenue, Arcadia. Dr. Gurman, who was recently discharged from the Army, served in general hospitals in France and in the field in the Philippines.

Officials at the Huntington Memorial Hospital announced the appointment of seven internes for the year starting July 1, 1947, from 53 applications, twice as many as had ever been received before. Among the appointees were Dr. Ernest B. Porter and Dr. Alfred G. Knudson, Jr., of Pasadena.

The new Overland Medical Clinic which recently opened at 2516 Overland Avenue, Culver City, under the management of Frank C. Morgenroth, M.D., is open to other doctors and their patients as well, Dr. Morgenroth stated. The Clinic has been open to the public for the past two months. Dr. Morgenroth is a graduate of Loyola Medical University of Chicago.

Dr. Henry C. Ward has announced the opening of new offices at 135 E. 9th St., Long Beach, for practice in diseases of the chest. Prior to military service in the European and South Pacific Theaters, Dr. Ward was connected with the Los Angeles County Health Department as Tuberculosis Clinician.

Eleven physicians and surgeons from Los Angeles County have been appointed as civilian consultants to the Army Medical Department. They are: Dr. Thomas H. Sternberg, Dr. Paul Starr, and Dr. Robert M. Shelton, Internal Medicine; Dr. Clarence H. Goddard, Neuropsychiatry; Dr. Gordon K. Smith, General Surgery; Dr. Robert W. King, Orthopedics; Dr. Burton L. Stewart, Urology; Dr. Richard D. Pettit, Obstetrics and Gynecology; Dr. Fordyce A. H. Johnson, Ear, Nose and Throat; Dr. Richard S. Harrison, X-Ray; Dr. Grant Balding, Ophthalmology.

Dr. H. L. Gotfredson, released from the Army Medical Corps in July, has announced the reopening of his offices at 1141 Fremont Avenue, South Pasadena. While in the Army, Dr. Gotfredson was on the staff of the hospital at Camp Swift, Texas.

After a long illness, Dr. J. O. Wilke of North Grand Avenue, Covina, will take up practice again at his new offices at 218 West Badillo Street, Covina.

Dr. Willis Jacobus has succeeded Dr. Packard Thurber as University of Southern California athletic medical director. Dr. Thurber, after 21 years as medical director, resigned to devote all his time to general practice.

Retirement of Dr. William L. Weber as chief surgeon of the Pacific Electric Hospital Association after 33 years of service has been announced by O. A. Smith, president of the railway. Dr. Weber will be succeeded by Dr. A. M. Scholz.

PLACER-NEVADA-SIERRA

Members of the Placer-Nevada-Sierra Medical Society have decided to erect a hospital in western Nevada County, it was announced by Dr. O. F. Lang, who has been chosen chief of staff of the projected hospital. The cost will be financed primarily by the officers and members of the society. The following physicians have been chosen to serve on the new staff: Dr. Lang, chief; Dr. B. W. Hummelt, assistant chief, and Dr. Daniel M. Hirsch, secretary-treasurer. Drs. G. A. Foster, O. P. Fry, H. L. Karo, H. N. March, S. F. Tobias and F. L. Smith are members.

SAN BERNARDINO

Dr. Albert Wical, an ex-Navy physician and surgeon, is now associated with Dr. Nile I. Reeves in Banning. Both Dr. Reeves and Dr. Wical are graduates of the College of Medical Evangelists at Loma Linda.

Major Kenneth A. Abbott, Ontario physician and surgeon, has been awarded the Bronze Star "for meritorious achievement in connection with military operations against the enemy on Cebu, Philippine Islands, from March 26 to April 25, 1945." Doctor Abbott is at present taking special work at the Mayo clinic, Rochester, Minnesota.

SAN FRANCISCO

Dr. J. C. Geiger, who has received many foreign decorations for his work in public health, recently was honored by his own city for serving 15 years as health director. City officials and members of the medical fraternity called upon him to extend congratulations, and employees of the department presented him with a testimonial scroll.

After nearly half a century of practice and teaching, Dr. Harold Brunn has retired from practice. The 72-year-old surgeon came to San Francisco in 1897. He was for many years clinical professor of surgery at the University of California, and gave his own funds to establish the thoracic clinic of the school at the San Francisco Hospital. Later he reorganized Mount Zion Hospital and established it as a medical research center. More recently he established a heart disease research institute, now known as the Harold Brunn Institute for Cardiovascular Research.

A study of alcoholism in San Francisco is soon to be undertaken by the Mental Hygiene Society of Northern California, according to recent announcement by Jack Spear, executive secretary. The society expects the study will lead to an organized educational program with cooperation from other interested organizations.

"San Francisco is one of the largest consumers of alcoholic beverages in the United States," reports the Society. "Of each 100,000 of the San Francisco population there are 411 chronic alcoholics."

Cost of alcoholic patients at San Francisco Hospital for the year 1945-46 was \$66,998.75 and at the Emergency Hospitals was \$8,455.49, totaling \$75,-

454.22, according to Dr. J. C. Geiger, Health Director. "This," he said, "by no means represents the total cost of alcoholism in the emergency hospitals, as many accidents, such as falls and automobile accidents are of alcoholic origin."

The proposed community education program, according to Mental Hygiene Society plans, will be directed to the general public, as well as professional persons. It will cover the nature, causes and treatment of alcoholism.

SAN JOAQUIN

The San Joaquin Medical Society has announced reactivation of the **Stockton Post-Graduate Study Club** after four years of inactivity. The program of lectures covering a wide range of medical subjects will be delivered by prominent men in the medical world. The Stockton Postgraduate Study Club, with club rooms in the Medico-Dental building, is the only one of its kind in California outside of Los Angeles, according to Dr. C. A. Broadbush, Study Club chairman.

Dr. Louis L. Ghiglieri has resumed his practice of medicine at 940 N. Hunter, Stockton, after more than three years of army service. During his overseas duty he attended lectures at the Oxford University School of Medicine, and the School of Medicine at the University of Heidelberg, in Germany. Dr. Ghiglieri is a graduate of Stanford University School of Medicine.

SANTA CLARA

Dr. F. R. Anderson, who was released from active duty in the Navy last fall, will have offices in the newly renovated building at 71 North Baldwin, Sierra Madre.

A program of training in neuropsychiatry including clinical instruction and residence training for doctors has been started by the Veterans' Administration Hospital in North Palo Alto.

Training will be given to doctors in three brackets. (1) The regular physicians on the hospital staff who wish to brush up on certain subjects, (2) 30 doctors, veterans of the war, who wish to study neuropsychiatry so as to be able to pass the American Board examinations in this field, and (3) 25 recent medical school graduates who received their education under either the Army Specialized Training Program or the Navy's V-12 plan.

TULARE

Dr. W. P. Bowen, who has been a practicing physician in Lindsay for 25 years, has retired. Dr. Bowen's practice has been taken over by Dr. Arthur A. Mickel, who, though a resident of Lindsay, has had his offices in Exeter.

GENERAL NEWS

Appointment of new faculty to the **School of Public Health, University of California**, is announced by Dr. W. McD. Hammon, Dean.

Dorothy Nyswander, Ph. D., has been engaged as Professor of Health Education. Dr. Nyswander is a graduate of the University of California. She is nationally known in public and school health education circles and has recently been engaged in the educational program of the Office of the Coordinator of Inter-American Affairs.

Leon Lewis, M.D., has been appointed Professor of Industrial Health. A graduate in medicine of the University of Pennsylvania, Dr. Lewis was for a time staff physician and director of laboratories for

the California State Department of Institutions at Sonoma State Home. For 12 years he was engaged in private consultation and laboratory practice in industrial medicine in Newark, N. J., and New York City. During the war, Dr. Lewis was a commander in the U. S. Navy.

Miss Edith Lindsay has been appointed Assistant Professor in Hygiene. Miss Lindsay graduated from Stanford University and has taught hygiene in that institution and at Mills College.

J. J. Gallagher, manager, has announced the appointment of Frank J. Filippi as Claims Superintendent for the **State Compensation Insurance Fund**. He succeeds P. G. McWhinney who, after 18 years of service, has reached the retirement age under the State Retirement System. Mr. Filippi has been a member of the Fund's legal staff since 1934.

The resident training program in neuropsychiatry at the Los Angeles Veterans Administration Center, which began August 15, still has vacancies available for veterans who desire specialized training in neuropsychiatry. The program prepared by the Deans' Subcommittee on Neuropsychiatry is designed to prepare the resident for the examination of the American Board of Psychiatry and Neurology. Faculty members of the medical schools of University of Southern California and College of Medical Evangelists are participating in the training program.

Courses in psychopathology, clinical psychiatry, neuropathology and clinical neurology are being given the current semester. Staff conferences and rounds with consultants are part of the training.

Inquiries should be addressed to Dr. Samuel D. Ingham, Chairman of the Deans' Subcommittee on Neuropsychiatry, 727 West Seventh Street, Los Angeles 14, California; or to the Director of Clinical Psychiatry, Neuropsychiatric Hospital, Veterans' Administration Center, Los Angeles 25, California.

A retirement program for employees in nonprofit hospitals throughout the country has been launched by the American Hospital Association. As a result of studies by a pension committee, a special plan for hospitals has been developed in cooperation with the National Health and Welfare Retirement Association.

In making this announcement, John H. Hayes, president-elect of the Hospital Association and chairman of its pension committee, pointed out that hospital workers are not now covered by social security benefits and for this reason hospitals are at a disadvantage in employing high-grade workers.

The plan provides for joint employee and employer contributions, the optional provision by the hospital of benefits for past service, fully vested rights for retirement purposes to the employer's contributions and transferability between hospitals which are members of the plan. In case of death the employee's contributions plus interest are paid to his beneficiary. All permanent employees over 25 years of age, with one year or more of service, are eligible to join provided the hospital votes to make the payments on a payroll deduction basis.

The fifth annual meeting of the **American Academy of Dermatology and Syphilology** is scheduled for Cleveland, Ohio, December 7-12, it is announced by Dr. Earl D. Osborne, Secretary of the Academy, 471 Delaware Ave., Buffalo, N. Y. This will be the first meeting of the group since December, 1941, and

it is expected to attract more than 1,000 members, according to Dr. Osborne.

Principal sessions will be held at the Statler hotel with **daily symposia** at the Allerton hotel and teaching clinics at Cleveland City hospital Monday, Tuesday, and Wednesday of the convention week. The meeting will feature **special lectures** by members of the Academy and by famed authorities in such other fields as atomic energy, radiology, and surgery.

Most special lectures, special courses and symposia will be presented on the first four days of the week, beginning December 9.

The American Association for the Study of Goiter again offers the Van Meter Prize Award of \$300 and two honorable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The Award will be made at the annual meeting of the Association which will be held in Atlanta, Georgia, April 3, 4, and 5, 1947, provided essays of sufficient merit are presented in competition.

The competing essays may cover either clinical or research investigations; should not exceed 3,000 words in length; must be presented in English; and a typewritten double spaced copy sent to the corresponding secretary, **Dr. T. C. Davison**, 207 Doctors Building, Atlanta 3, Georgia, not later than January 1, 1947. The committee which will review the manuscript is composed of men well qualified to judge the merits of the competing essays.

A place will be reserved on the program of the annual meeting for presentation of the Prize Award Essay by the author if it is possible for him to attend. The essay will be published in the annual Proceedings of the Association. This will not prevent its further publication, however, in any journal selected by the author.

The American Academy of Allergy will hold its annual convention at Hotel Pennsylvania, New York City, November 25-27 inclusive. Physicians interested in allergic problems are invited to attend the sessions as guests of the Academy without payment of registration fee. The program has been arranged to cover a wide variety of conditions where allergic factors may be important. Papers will be presented dealing with the **latest methods of diagnosis and treatment** as well as the results of investigation and research. Advance copies of the program may be obtained by writing to the Chairman on Arrangements, **Dr. Horace S. Baldwin**, 136 East 64th Street, New York City, before November 10.

Formation of the Medical Advisory Council to the **National Cancer Foundation** with **Dr. George T. Pack** as its chairman was announced last month. Need for hospital facilities for treatment and terminal care of the great number of patients with incurable cancer is "one of the most urgent public health

problems of the day," Dr. Pack said. Purpose of the hospitalization of the advanced cancer patient "is not solely to relieve any home or family of a difficult social and financial burden, but more important still, to do something for the unfortunate patient," he said.

The Advisory Council will work with Julius Jay Perlmutter, president of the National Cancer Foundation, under the direction of Dr. Pack.

Other members of the Council, which is as yet incomplete, will be: Dr. Halsey Bagg, Dr. Gemma Barzilai, Dr. E. V. Cowdry, Dr. Howard J. Curtis, Dr. Andrew J. Donnelly, Dr. G. Failla, Dr. Benjamin L. Feuerstein, Lt. Colonel Milton Friedman, Dr. Harry B. Friedgood, Dr. Richard H. Hoffman, Dr. Ira I. Kaplan, Dr. Daniel Laszlo, Dr. Michael Levine, Dr. Rudolph Matas, Dr. Edgar Mayer, Dr. George P. Miley, Dr. Sherwood Moore, Dr. John E. Mosley, Dr. Frank Ober, Dr. George T. Pack, Dr. Stanley P. Reimann, Dr. Simon L. Ruskin, Colonel Albert E. Russell, Dr. Isabel Scharnagel, Dr. Joseph O. Smigel, Dr. George M. Smith, Dr. Henry K. Wachtel, Colonel Stafford L. Warren.

Addition of **Rear Admiral Lucius W. Johnson** (MC) United States Navy (retired) to the staff of the **American College of Surgeons** is announced by the College. Dr. Johnson is at present the field representative of the College in the Pacific Coast area where he is conducting surveys in Hospital Standardization and Graduate Training in Surgery.

Four California doctors are among the 19 medical men recently named as members of the National Medical and Scientific Advisory Council of the **National Arthritis Research Foundation**. They are **Dr. Harry James Deuel, Jr.**, bio-chemist, University of Southern California School of Medicine; **Dr. Herbert McLean Evans**, professor of Anatomy and director of the Institute of Experimental Biology, University of California; **Dr. Karl F. Meyer**, professor of Medicine and director of the George Williams Hooper Foundation for Medical Research, University of California; and **Dr. Franklin Richards Nuzum**, director of Cardio-Vascular Research at the Santa Barbara Cottage Hospital.

Two fellowship for **study of rheumatic heart disease**, have been awarded by the **American Legion** and its auxiliary from a fund of \$50,000 they subscribed to fight the "nation's greatest child killer." The fellowships go to two war veteran doctors. One is Dr. Samuel T. Schlamowitz, who will act as research fellow under **Dr. Arthur C. DeGraff** and **Dr. Samuel A. Brown**, professor of therapeutics, New York University College of Medicine. The other is Dr. Joseph Warren, who, under the direction of **Dr. T. Duckett Jones**, will study the changing glandular conditions of the body affecting rheumatic conditions, at the House of the Good Samaritan in Boston.



INFORMATION

Steps in Buying War Surplus Medical Equipment

Medical men who are veterans of World War II are in a favorable position to purchase professional equipment and supplies through the War Assets Administration.

The two regional WAA offices in California estimate they have already materially aided hundreds of California medical men in reestablishing themselves professionally through purchases of surplus war items.

The variety of medical and surgical equipment which WAA has sold, is selling or will sell, is as extensive or as restricted as the surplus supplies from the sources from which it originates, the military forces. Some items—and many medical items among them—are in relatively short supply.

Many items in short supply, for which the veteran demand is large, have been put upon a "set aside" list. Until further notice, these items can be sold only to veterans of World War II. The usual rule is "one unit to a customer."

The fact that merchandise is included on the "set aside" list is no warranty that it is available for veteran buyers. War Assets can sell only property which has been declared surplus and many "set aside" items are in such short supply to WAA that only a fraction of the would-be buyers will ever get them.

The "set aside" list includes such medical and surgical equipment as cystoscopes, slit lamps, eye, ear, nose and throat diagnostic cases, x-ray equipment and accessories, physiotherapy equipment, including baths and baking equipment; laboratory equipment such as microscopes and accessories; stereoscopes; miscellaneous hospital equipment such as tables, lamps, stools, sterilizers.

Other items, although not peculiar to the medical profession, are also on the set-aside list. They include a great variety of various types of items, including typewriters, desks, chairs, cabinets and tables.

Medical items are generally sold at about one-half the original cost to the government.

To become eligible to purchase goods from WAA under a veteran's high priority, a professional man, like other veterans of World War II, must be certified at one of the WAA veterans' offices. There are ten of these in the San Francisco region alone. There are scores in other regions throughout the country.

Northern California certification offices are located at: 1540 Market Street, San Francisco; Civic Auditorium, Oakland; Chamber of Commerce Building, Sacramento; Chamber of Commerce Building, Stockton; 2138 Merced Street, Fresno; 1407 California Street, Redding; Army Headquarters, East Alisal Street, Salinas; 2510 M Street, Bakersfield, and Fourth and Ryder Streets, Vallejo.

In Southern California there are certification offices at 450 Fargo Street, Indio; 241 W. Broadway, Long Beach; 3636 W. Beverly Boulevard, Los Angeles; 100 E. Carrillo, Santa Barbara; 388 4th Street, San Bernardino and 4205 Pacific Highway, San Diego.

Before being certified, a veteran must present a copy (a photostatic copy will do) of his discharge papers or terminal leave orders to WAA veterans' certification office. If buying strictly medical supplies and equipment, the veteran must also present evidence of his profession. Usually this evidence is sufficiently noted on his service papers.

He is then assigned a case number which shows his relative precedence in date of application. This number is important for in the case of such critically short items as certain medical and surgical equipment allocation is made to veterans whose case numbers are the lowest; in other words, to those who applied first.

After certification, the veteran's name is placed on a list to receive notice of sale of the type of items for which he is applying. When the material becomes available, he is sent a catalog.

Upon receiving such a catalog he may make his proposed selections. Most such transactions are carried on by mail. Delivery is often made within 48 hours after a sale closes.

Credit and installment contracts are available to those who qualify.

If the material requested is not located in this region, a special division makes a nation-wide search. It is a rule of the Veterans' Division of WAA, whose personnel is made up largely of veterans of World War II, to turn nobody away without an answer. In order to find the answer, WAA has the advice of a number of specialists long experienced in medical and surgical sales.

It is to commercial channels that the medical man who is not a veteran of World War II must look in buying surplus property sold by WAA. Items sold to commercial channels are generally in relatively long supply or of such a nature that it is advisable to sell them quickly, hence in large quantities. Some items in particularly long supply are available for export.

Veterans of World War II have a high priority also to purchase the so-called "long supply" items. However, instead of rating a top priority as in the case of set-aside items, they rate second priority. The federal government has the first and highest priority to purchase "long supply" items.

WAA officials themselves caution medical men against undue hopes of obtaining any and all equipment they need from the WAA. The set-aside list, it was explained, is itself as far as a listing considered more or less permanent—but because items are listed on the set-aside list does not mean they have been physically set aside themselves. Such items are not available at all times.

For example, microscopes have been listed in the set-aside list for some time, but only a minor trickle has been declared surplus and available for sale.

Medical items which are sold, having generally originated from either the Army or the Navy, are as a rule standard medical equipment. However, for personal satisfaction, WAA recommends inspection of any potential purchase for items are generally sold on a "where is, as is" basis.

Efforts are also made by WAA to effect an equal distribution of medical items on the basis of population in regions in the United States. Thus each area is, as far as is humanly possible, guaranteed a fair share of scarce items, although the items themselves may be stored in a distant part of the country.

If you are an eligible veteran, WAA urges the earliest possible certification, for Robert M. Littlejohn national Administrator, has set next July 1 as the "target date" for the sale of the major portion of all surplus.

Letters to the Editor . . .

THE ARMY MEDICAL LIBRARY

Physicians who served in World War II have genuine occasion to be thankful for the splendid services rendered by the Army Medical Library. Reference texts, periodicals, and micro-film of important reference material were sent promptly for the use of medical officers at medical installations anywhere that troops were operating. This service assisted materially in maintaining the high standard of technical efficiency accomplished by the medical service during the war.

Now that we are gradually returning to peace, it would be wise for physicians to remember the services which the Army Medical Library can continue to furnish. The Army Medical Library publishes a "Current List of Medical Literature" which all county societies may obtain, for the purpose of aiding in acquiring important current medical literature. The Army Medical Library will continue to assist physicians throughout the country in obtaining important medical literature, by request through an appropriate local medical library.

The Army Medical Library is the greatest repository for medical literature in the world. It has the largest and most complete collections of all types of medical books and journals in existence.

Unfortunately, the Army Medical Library at present is housed in an old fire trap of a building on the Washington Mall. Congress has, however, authorized the erection of a new building to house the Army Medical Library in proximity to the great Library of Congress. It is expected that funds for this new building will be provided at the next session of Congress. Physicians can help greatly in asking congressmen to support the work of the Army Medical Library.

To catalog and classify the great collections of the Army Medical Library is no slight task. The Index Catalog of the Army Medical Library is the most important index of world medical literature. The Army Medical Library cooperates closely with the American Medical Association in maintaining the *Quarterly Cumulative Index*, which is used so extensively by physicians and scientists everywhere to keep abreast of current medical advance.

California physicians have a particular interest in the Army Medical Library because it has assisted for so many years in maintaining the highest quality of medical library service on the Pacific Coast. The Army Medical Library helped in establishing the medical periodical service for rural physicians, first proposed by Doctor George Kress, and maintained by the Library of the University of California Medical Center. It might be wise for the California Medical Association to make arrangements with the University of California for the revival of this important service.

It is essential in the modern practice of medicine for physicians to keep abreast of current advances. This can best be done by systematic attention to important medical periodicals, where original work appears, or where appropriate references and reviews are given to significant new developments. It is essential that physicians always and everywhere support local medical library efforts. It is also essential that physicians throughout the country unite in giving the best possible support to the great

central collection of medical books which serves the whole country, the Army Medical Library.

CHAUNCEY D. LEAKE, M.D.
University of Texas Medical School,
Galveston, Texas.

CRYSTALLIZATION OF BACTERIAL TOXINS

Successful crystallization of tetanal and botulin toxins are reported by Lamanna¹ and associates of Camp Detrick, Maryland and Pillemer² and his coworkers of the Pathological Institute, Western Reserve University.

Lamanna inoculated five gallon carboy lots of a 0.3 per cent casein, 0.5 per cent glucose and 1 per cent alkali-treated corn steep liquor medium with *Clostridium botulinum*. Maximum toxin production was reached after 80 hours' incubation at 34°C. At this time the intraperitoneal mouse titer reached 800,000 MLD per cc.

In the first step of chemical purification the cultures were precipitated at pH 3.5 by the addition of HCl. The resulting "acid mud" consisted of a mixture of toxin, nucleic acid, undigested casein, material from corn steep and organisms. In seven succeeding steps the toxin was resuspended or redissolved in decreasing volumes of distilled water or salt solution. From each it centrifuged, salted out or otherwise separated from one or more of the contaminants. The final product was a 300-fold concentration of purified toxin in dilute sodium acetate solution. After standing overnight in the refrigerator, toxin crystals separated from this solution. Recrystallization was effected from a supersaturated distilled water solution.

The crystals thus obtained were needle-like structures from 5 to 7 microns in width, and 85 to 125 microns long. The crystals give positive protein reactions. Electrophoretic mobility suggested that the crystalline material was a single chemical substance. Membrane diffusion suggested a molecular weight between 1 and 2 million.

Adopting a somewhat similar technique Pillemer² and his associates isolated and crystallized tetanal toxin. Crystallization of the final product occurred slowly at -8°C from a 25 per cent methyl alcohol solution. The crystals disintegrated and redissolved in the mother liquor at temperatures above 0°C. Microscopically the crystals appeared as irregular triangular or rhomboid structures, with an occasional elongated spear-shaped form. Solutions of the crystals give positive protein reactions. The material showed constant biological activity on recrystallization. The toxicity was readily destroyed by heat, acid or alkali, confirming in this regard its assumed identity with tetanal toxin. Detailed studies of this crystalline toxic protein are now in progress.

W. H. MANWARING,
P. O. Box 51,
Stanford University.

REFERENCES

1. Lamanna, C., McElroy, O. E., and Eklund, H. W., *Science*, 103:613 (May 17), 1946.
2. Pillemer, L., Wittler, R., and Gronberg, D. B.: *Science*, 103:615 (May 17), 1946.

BOOK REVIEWS

A PRIMER FOR DIABETIC PATIENTS: An outline of Treatment for Diabetes with Diet, Insulin and Protamine-Zinc Insulin, Including Directions and Charts for the Use of Physicians in Planning Diet Prescriptions. By Russell M. Wilder, M.D., Ph.D., University of Minnesota; Senior Consultant in Division of Medicine, Mayo Clinic, Eighth Edition, Reset. 192 pages, with 8 illustrations. Philadelphia and London: W. B. Saunders Company, 1946. Price \$1.75.

This small book is written for patients. This, the 8th edition, continues to follow the excellent plan of the preceding editions in that it is written in a concise and non-technical manner, thus enabling patients to properly understand the ultimate goal of therapy.

Although no major changes have been made in the method of treating diabetes, many minor alterations in the procedures heretofore employed have been developed since publication of the 7th edition. These are included in the present volume.

As in the previous editions the author utilizes a procedure of first giving a brief discussion and then outlining, in question form, the salient points of the preceding chapter. The discussions are therapeutically sound, and written in a concise form so that little or no misunderstanding can result. The chapter on Protamine Zinc Insulin includes a brief discussion of the use of mixtures of various insulins which has been recommended by several clinicians as being a satisfactory method of supplying the necessary insulin in a single injection.

There is included in this edition a chapter for the physician, on "Diet" which is a very sound discussion of this part of the therapy for diabetes. Although Dr. Wilder qualifies this chapter by stating that the type of treatment best suited for the individual diabetic patient should be left to the judgment of the physician, he nevertheless summarizes a dietary regime which can be utilized to advantage particularly by those clinicians who treat diabetes infrequently.

Appended are the usual height and weight tables and the various food tables necessary for the patient to properly prepare menus which correspond to the physician's prescription.

This book is one of the better manuals for diabetic patients. It can be studied to advantage by both patients and clinicians.

MANSON'S TROPICAL DISEASES—A MANUAL OF THE DISEASES OF WARM CLIMATES. Edited by Philip H. Manson-Bahr, C.M.G., D.S.O., M.A., M.D., D.T.M. and H. Cantab, F.R.C.P., Lond. Senior Physician to the Hospital for Tropical Diseases, London, the Albert Dock Hospital and the Tilbury Hospital; Consulting Physician to the Colonial Office and Crown Agents for the Colonies; Consultant in Tropical Diseases to the Admiralty and to the Royal Air Force; Director, Division of Clinical Medicine, London School of Hygiene and Tropical Medicine; Lecturer on Tropical Medicine to the London Hospital; Corresponding Member of the Société de Pathologie Exotique; Member of the Washington Academy of Medicine; late Examiner in Tropical Medicine to the Conjoint Board of the Royal College of Physicians and Royal College of Surgeons, England, and to Cambridge and Hongkong Universities. Author (with A. Alcock) of "The Life and Work of Sir Patrick Manson," 1927; "The Dysenteric Disorders," 1939 and "Synopsis of Tropical Medicine," 1943. Twelfth edition. Cloth. Price, \$12.00. Pp. 1068 with 17 color plates, 9 half-tone plates, 406 figures in the text, 6 maps; and 28 charts. A William Wood Book. Baltimore: The Williams and Wilkins Company, 1945.

The twelfth edition of this standard encyclopedic text is excellent. It reflects the many years of wide experience with tropical diseases which the British have had during their long period of prominence in tropical areas. More specifically it reflects the experiences of Sir Patrick Manson, the author of earlier editions and of Manson-Bahr, who has carried on in later years. In it physicians

will find excellent descriptions of the clinical phases of tropical diseases. The tone of the volume, characteristically British, is conservative.

The chapter on rickettsiosis has been fully revised, and that on leprosy modernized. The latter change in particular is a desirable one.

The author states in the preface that special attention has been devoted to malaria, yellow fever and nutritional diseases. The American clinician with experience in World War II will be somewhat disappointed to find in this book, published in 1945, little data on experiences with suppressive therapy of malaria with chemical substances and on the use of D.D.T. Furthermore, none of the experiences of Americans with filariasis and tsutsugamushi fever in the Pacific Islands are mentioned in the book. Not all of this material was restricted information in 1945. American clinicians will furthermore not be concerned too much with advanced states of deficiency disease in the tropics. Among military personnel these conditions rarely occurred except in prisoners of war, and most natives unmolested do not acquire them. Deficiency disease should hardly be thought of or classified as tropical diseases.

Despite these minor criticisms, this book ranks high and is one of the best on the subject.

QUICK REFERENCE BOOK FOR MEDICINE AND SURGERY. Thirteenth edition. By George E. Rehberger, A.B., M.D. J. B. Lippincott Company. A clinical, diagnostic, and therapeutic digest of general medicine, surgery, and the specialties, compiled systematically from modern literature.

Dr. Rehberger has written an extremely useful book for the general practitioner of medicine. It is encyclopedic in its scope, logical and orderly in development, perhaps a little ponderous in places (some of the material could have been advantageously deleted), but on the whole it is remarkable, especially in the field of therapeutics, where both the art and science of treatment are ably discussed. The information is amazingly up-to-date.

The book is organized for quick reference, because the diseases discussed are arranged in alphabetical order, and for the various specialties it is further refined, since the subject matter of the specialist is set off in sections by thumb tabs. This volume should be on the bookshelf of every clinician.

COMPLETE HANDBOOK ON STATE MEDICINE. By J. Weston Welch. 1946. 170 pages, 8½x11 inches, lithographed. Platform News Publishing Co., Box 66, Pearl St. Station, Portland, Maine. Price \$2.50 per copy.

This is a rather remarkable booklet containing most of the well known arguments for and against compulsory sickness insurance (as exemplified by such measures as the Wagner-Murray-Dingell Bill). The author has apparently been exposed to some sound reading on the art of debate and the technique of the well tossed argument. The book is not easy reading; the ink on some of the pages of your reviewer's copy printed out a light grey. The absence of double spacing the paragraphs results in crowding too much text on one page.

Despite these defects, the handbook is recommended to all thinking physicians who would be prepared to discuss the problems involved in the wider distribution of medical services with their patients and friends.

UROLOGIC ROENTGENOLOGY. By Miley B. Wesson, M.D., Ex-President American Urological Association, San Francisco, California, second edition, thoroughly revised.

published 1946. Octavo 259 pages, illustrated with 258 engravings. Cloth, \$5.50. Lea & Febiger, Washington Square, Philadelphia.

The second edition of Wesson's book has been completely revised and is the only recently published book on urologic roentgenology. The newer procedures of urography, including technique, pitfalls and complications are thoroughly discussed and there are instructive chapters on the history and technique of urography. The illustrations are numerous, many new ones having been added; they are well defined and clearly picture the ordinary urologic conditions. The urograms, mostly from the author's cases, partly culled from a widespread source of material, are

reproduced clearly on excellent paper. A complete explanation and case discussion accompanies each illustration and in many cases an informative schematic outline aids in their interpretation. The text is also well filled with concise but satisfactory discussions of etiology, pathology, symptomatology and treatment.

This book is a compact, easily used reference work covering the usual urologic conditions. It is a satisfactory consulting source for the part-time or student urologist. It should also be a valuable aid to the great numbers of physicians who do not have ready access to expert urologic or roentgenologic consultation. The author makes no claim for it as a complete text on urography.

MEDICAL JURISPRUDENCE

INTERPRETATION OF THE BUSINESS AND PROFESSIONS CODE PERTAINING TO A HEARING FOR REINSTATEMENT OF A DOCTOR WHOSE LICENSE HAS BEEN REVOKED

HARTLEY F. PEART, ESQ., *San Francisco*

A decision recently rendered by the Superior Court of Los Angeles County is of interest to the legal and medical professions alike because of its interpretation and construction of a new section of the Business and Professions Code.

The petitioner sought a writ of mandate to compel the Board of Medical Examiners to grant him a hearing on a petition for reinstatement. In 1922 a reciprocity license based upon a license previously issued to him by the State of Missouri was issued in California to the petitioner. On October 18, 1932, this reciprocity license was revoked by the Board of Medical Examiners on the ground that the Missouri license had been procured by fraud and false representation. The fraud and misrepresentation upon which the Board based its order of revocation were evidenced by depositions of three witnesses taken October 17, 1928. The petitioner was not present at the hearing in Sacramento, although he had had due notice, claiming he was prevented from going from Los Angeles to Sacramento because his presence was required in court in Los Angeles on the same date. The order of revocation issued on October 18, 1932, was reviewed by the Superior Court in Los Angeles County and annulled by that court. On appeal, however, the District Court of Appeal of the State of California reversed that judgment, holding that in making its order of revocation the Board did not exceed its jurisdiction. (See *Rinaldo vs. Board of Medical Examiners*, 5 Cal. App. 2nd, 345.)

The petitioner recently filed a petition with the Board requesting an opportunity to present evidence which he contended would establish the falsity of the proofs presented to the Board at the hearing on October 18, 1932. It was claimed on his behalf that *Section 2376.5 of California Business and Professions Code*, first enacted in 1943, entitled him as a matter of right to a hearing for the purpose of reinstating the revoked certificate. This section is as follows:

"A person, whose certificate has been revoked or

suspended for more than one year, may petition the Board to reinstate the certificate after a period of not less than one year has elapsed from the date of the revocation or suspension."

The Board, upon presentation of the petition, declined to hear it or receive any evidence under it upon the ground that the section in question only authorized hearings on petitions based upon revocation of a license which had been valid when issued and not upon revocation of a license which had been issued improperly upon fraudulent representations.

The Los Angeles Superior Court held that this new section of the Business and Professions Code made it mandatory for the Board to grant a hearing on the petition for reinstatement of the license of any doctor whose license has been revoked. The court said that "by its terms, one who formerly held a license to practice medicine in California whose certificate had been revoked, is granted the right to petition the Board to reinstate the certificate after a one year period from date of revocation." Continuing, the court held that by filing his petition, petitioner placed upon the Board the duty to entertain, hear and determine such petition, on the hearing of which petitioner could offer testimony that the original evidence was false in all material points in an effort to show that the order of revocation issued on October 18, 1932, should be rescinded.

In the words of the court: "As a remedial act, this section of the Business and Professions Code must be liberally construed so as to effectuate its object and purpose and to bring within the scope of the law every case which comes clearly within its spirit and policy. It is clear that the legislature intended to furnish the Board of Medical Examiners authority and power to take upon petition and review any order of revocation and suspension."

Thereupon, it was ordered that a writ of mandate be issued directing the Board of Medical Examiners to grant petitioner a hearing and enter a decision upon his petition.



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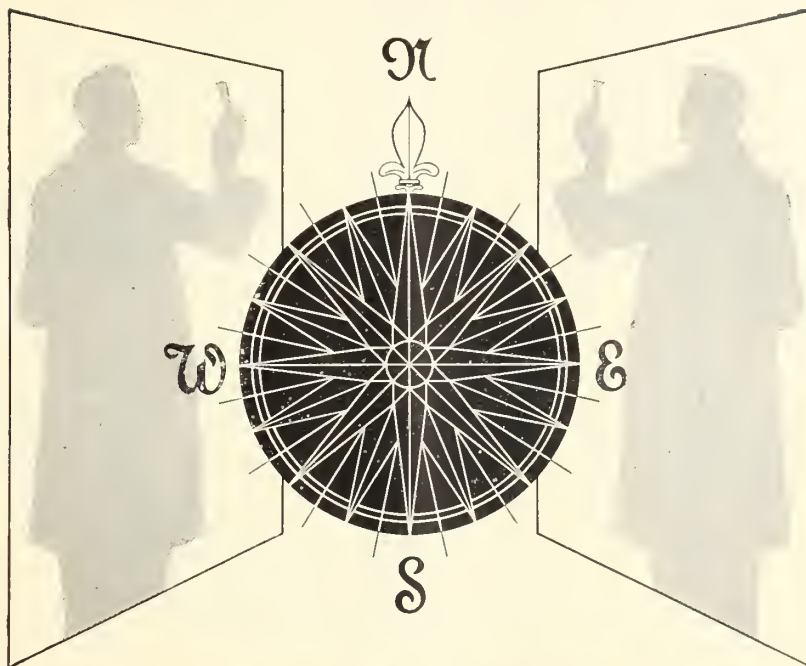
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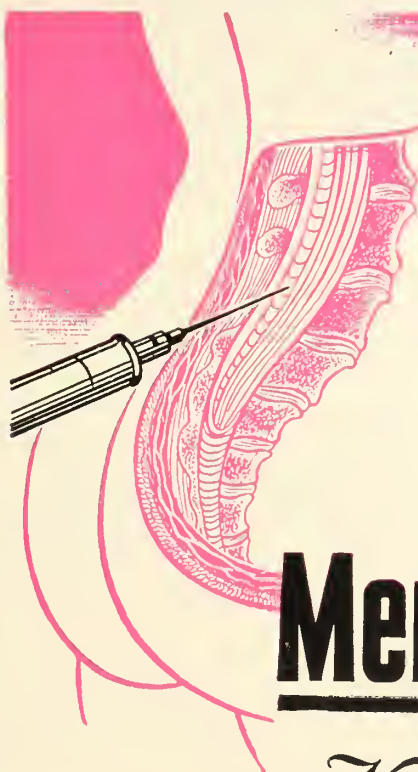
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As soon as the diagnosis is established, penicillin therapy should be instituted in doses of 20,000 to 40,000 units every two to three hours by the intramuscular route. Treatment should be thorough, and should be continued until all signs and symptoms of the infection have been absent for seven to ten days. Since penicillin administered systemically does not penetrate the subarachnoid space, intrathecal (intraspinous, intracisternal, intraventricular) administration is also required. Ten thousand units in 10 cc. of isotonic solution of sodium chloride should be injected (after withdrawal of an equal volume of fluid) once or twice daily until the spinal fluid is clear, and for four days thereafter.

When concurrent sulfonamides are indicated, they should be administered in a dosage sufficient to establish a blood level of 15 mg. per cent.

Surgical, supportive, and other measures should be employed when indicated.

SPINK, W. W., and HALL, W. H.: *Penicillin Therapy at the University of Minnesota Hospitals: 1942-1944*, *Ann. Int. Med.* 22:510 (April) 1945.

WHITE, W. L.; MURPHY, F. D.; LOCKWOOD, J. S., and FLIPPIN, H. F.: *Penicillin in the Treatment of Pneumococcal, Meningococcal, Streptococcal, and Staphylococcal Meningitis*, *Am. J. Med. Sc.* 210:1 (July) 1945.

TYPHOID PATIENTS RESPOND TO THERAPY WITH BACTERIOPHAGE

Five California physicians reduced the death rate to 5 per cent among a group of 56 typhoid patients who were treated with a virus-like agent known as bacteriophage, according to an article in the September 21 issue of *The Journal of the American Medical Association*.

The physicians are Evelynne G. Knouf, of South Pasadena, Walter E. Ward, of Los Angeles, Paul A. Reichle, Los Angeles, A. G. Bower, Pasadena, and Paul M. Hamilton, San Marino.

The authors state that bacteriophage, considered a parasite of bacteria, has been used for the past ten years in the treatment of patients with typhoid fever in the Communicable Disease Unit of the Los Angeles County General Hospital, with which they are associated.

It is pointed out that the results with these patients were so spectacular because a specific type of bacteriophage was used for each patient. The number of bacteriophages is legion, the article says, but each differs in its ability to attack certain types of bacteria. Each patient was given the specific phage which would attack his own organisms.

The following results were immediately noted: (1) negative blood cultures 24 hours after treatment, (2) absence of fever, (3) immediate clinical improvement.

"One of the most spectacular objective accomplishments of this form of treatment," the doctors write, "was the rapidity with which the patient returned to his normal mental outlook. Within 24 to 48 hours after bacteriophage therapy, the patient who had been comatose and in the 'typhoid state' or who had demonstrated the characteristic whining, querulous, obstreperous manner amazed everyone by his cheerful, grateful, cooperative attitude. A state of well-being existed. Also, patients

whose anorexia before treatment was so great as to make forced feedings necessary, afterward usually asked for food, weakly at first and later vociferously."

Typhoid fever bacilli are spread by faulty sewerage and contaminated water or through infected persons by fingers, food and flies. Once the typhoid bacilli enter through the mouth they pass on through the stomach, enter the upper intestines, and set up an inflammation of the intestinal walls. They invade the lymph nodes, where they multiply rapidly, and then they enter the blood stream. The death rate for many years has remained around 10 per cent.

The specific bacteriophage in a dextrose solution was administered by injecting it into the veins over a period of four to seven hours. This was usually followed by a moderate chill lasting approximately 30 minutes. After the chill the doctors noted that the temperature began to mount and reached a peak of 105 to 107 F. within three to six hours. The temperature returned to normal within nine and one-half to 24 hours after treatment was started and in most instances remained normal thereafter.

In a discussion which accompanied the article, Dr. Wilton L. Halverson of San Francisco states: "The spectacular nature of the recovery of these patients is something we don't forget when we see the patient go through the episode. . . . I believe this is a contribution which will be of great importance to us in typhoid."

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Medical Films Available for Component County Medical Societies of C.M.A.

The Committee on Postgraduate Activities of the California Medical Association recently purchased 17 medical films. List of titles and time to run appears below.

Letters giving information concerning procedure for use of these films have been sent to the presidents and secretaries of all C.M.A. county societies.

Requests for films should be sent to C.M.A. Postgraduate Committee, 450 Sutter Street, Room 2009, San Francisco (8).

All films are "silents," that is, with explanatory legends. (Note. These films were made prior to World War I. Additional comment by discussants may be indicated, in order to bring information up to date.)

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5—	Cardiac Irregularities—Reel II	17 Min.	} 3 Reels 48 Min.
6—	Infections of the Hand—Reel I	17 Min.	
7—	Infections of the Hand—Reel II	17 Min.	} 3 Reels 41 Min.
8—	Infections of the Hand—Reel III	14 Min.	
9—	Indirect Inguinal Hernia—Reel I	16 Min.	} 2 Reels 29 Min.
10—	Indirect Inguinal Hernia—Reel II	16 Min.	
11—	Indirect Inguinal Hernia—Reel III	15 Min.	} 2 Reels 29 Min.
12—	Intestinal Peristalsis	16 Min.	
13—	Normal Heart	10 Min.	} 2 Reels 29 Min.
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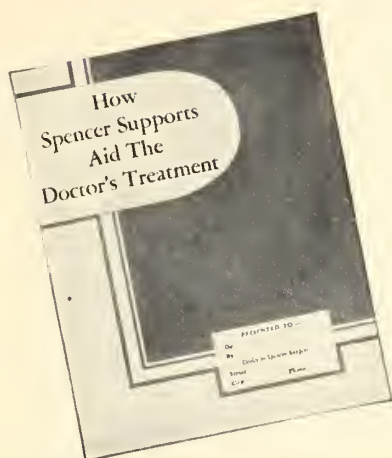
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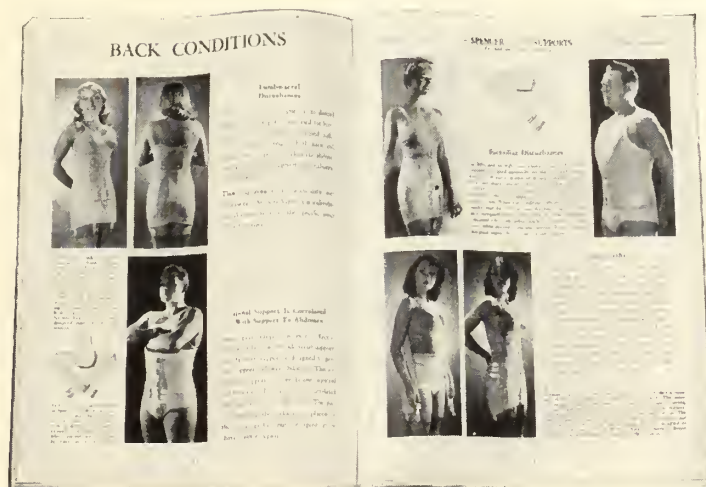
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BOARD OF MEDICAL EXAMINERS

By FREDERICK N. SCATENA, M.D.

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Board Proceedings

A regular meeting of the Board of Medical Examiners was held at the Biltmore Hotel, in Los Angeles, August 5 to 8, 1946.

Written examinations were conducted and hearings were held on petitions for restoration of revoked certificates, as well as on disciplinary matters.

The following actions were taken by the Board after a regular hearing:

William Everts Downing, M.D.—License suspended for one year, to be followed by five years' probation without narcotics, and additional terms.

William T. Engleman, M.D.—License revoked.

James A. Moran, M.D.—License suspended for one year, to be followed by five years' probation without narcotics, and additional terms.

Eugene Curry Nelson, M.D.—License restored and he was placed on probation for a period of five years with specified terms.

Gottfried Karl F. Schnarrenberger, M.D.—License suspended for six months, to be followed by five years' probation with specified terms.

Lee Smith, M.D.—License restored and he was placed on probation for five years without narcotics and additional specified terms.

John Jerome Tobinski, M.D.—License restored and he was placed on probation with specified terms.

Isaiah J. Waterman, M.D.—License restored and he was placed on probation with specified terms.

The next meeting of the Board of Medical Examiners will be held in Sacramento, October 21 to 24, inclusive.

The Board has given considerable thought and consideration to graduates of foreign medical schools, and as it has become impractical, if not impossible, to investigate or secure detailed reports of the type and quality of instruction given in such schools the Board, at the August meeting, passed the following rule:

"Applicants, including those applying for reciprocity upon a license from another state, a certificate issued by the National Board of Medical Examiners, or a commission as a medical officer in the United States Army, Navy, or Public Health Service upon graduation from foreign schools, whose resident professional instruction has been secured in teaching institutions located outside the United States and Canada and whose credentials are found sufficient in form by the Credentials Committee and the Board, and the information available is found insufficient to adequately determine the sufficiency and quality of the applicant's resident professional instruction shall be given and shall successfully take a written, oral and clinical examination suitable and sufficient to indicate the quality and sufficiency of his resident professional instruction."

This rule has the effect of eliminating direct reciprocity for graduates of foreign medical schools, as it provides that applicants whose credentials are acceptable will have to take a written, oral, and clinical examination, re-

(Continued on Page 48)



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REFERENCES: 1. Cornbleet, T. and Pace, E. R.: Arch. Derm. & Syph., 31:224, 1935. 2. Hansen, A. E.: Am. J. Dis. Child., 63:933, 1937. 3. Taub, S. J. and Zakon, S. J.: J. A. M. A., 105:1675, 1935. 4. Stoesser, A. V.: Ann. Allergy, 2:404, 1944.

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BOARD OF MEDICAL EXAMINERS

(Continued from Page 46)

ardless of whether they hold a license obtained by written examination in another state dated less than ten years prior to the filing of the application in the Board office.

The Board, at the recent meeting, extended the scope of investigation regarding applicants for restoration of revoked certificates or modification or termination of probation. These applicants, in addition to filing the information required in Section 2375.5 of the Business and Professions Code, will be required to show complete rehabilitation and to what extent they have kept themselves abreast of the current advances in medicine and surgery.

HYPERTENSIVE PATIENTS MUST BE RELIEVED OF FEAR AND ANXIETY

"One of every three deaths would be postponed, years of worry, economic dependence and illness would be remitted if arterial hypertension and its related diseases could be abolished," according to an article in the current issue of *Hygeia*, health magazine of the American Medical Association.

The authors—Irvine H. Page, M.D., associate member of the Rockefeller Institute and director of research for the Cleveland Clinic Foundation, and A. C. Corcoran, M.D., a staff member of the Rockefeller Institute Hospital who specializes in the physiology and pathology of high blood pressure and kidney disease—state that as yet the causes of this condition are still unknown. However,

(Continued on Page 50)

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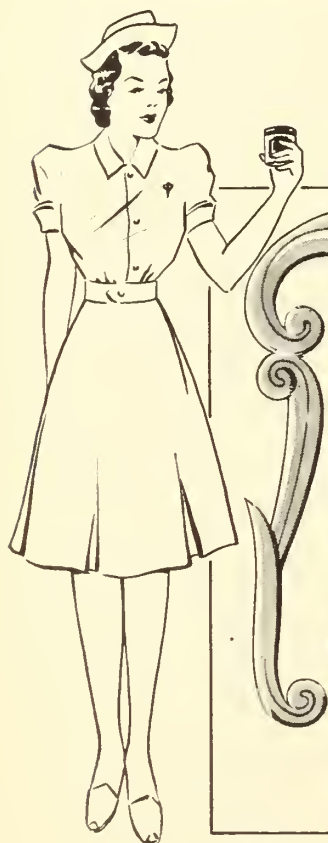
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HYPERTENSIVE PATIENTS MUST BE RELIEVED OF FEAR AND ANXIETY

(Continued from Page 48)

it has been recognized that hypertension occurs in the course of such diseases as Bright's disease, inflammation of the kidney and tumors of the adrenal glands.

The problem of arterial hypertension has two major facets, the first being the removal of the causes of increased pressure and the other the arrest and prevention of vessel damage. Drs. Page and Corcoran believe that one observation in animals has greatly stimulated research on this problem. "This was the demonstration that partial clamping of the artery which nourishes the kidney results in a persistent increase of arterial pressure that mimics the arterial hypertension of human beings.

This clamping sets up a disturbance in the flow of blood through the kidney which stimulates the liberation from it of a substance called renin. Renin interacts in the blood with another substance to liberate a third compound, angiotonin. Angiotonin or something chemically like it, then contracts the arterioles and increases the heart's effort. The result of its action is a sustained elevation of arterial pressure. Some evidence indicates that long-established experimental hypertension of this sort causes arteriolar damage of the type which may develop in human beings.

"This accounts for the hypertension that may complicate certain types of kidney disease. It may also be the cause of some of the increase in pressure in patients with arterial hypertension whose kidney vessels are damaged. Damage to the arterioles of the kidney, although

(Continued on Page 52)

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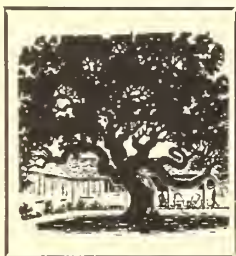
(Continued from Page 50)

common in established and severe hypertension, is not found in the early and mild forms of the disease. It is still rather unlikely that we have accounted for the first elevations of arterial pressure in human beings."

There are certain general measures that can be taken to relieve hypertension. Among these are the avoidance of unpleasant emotions such as fear, anger or anxiety which may temporarily increase arterial pressure; moderation in diet and, in the presence of obesity, deliberate, slow reduction of body weight to a level preferably a little less than normal for the patient's height and age.

Operations are performed for the relief of arterial hypertension. They consist in severing many of the nerves which stimulate blood vessels.

King George III (1738-1820).—Though George III was a manic-depressive, the king who lost the American colonies was withal a dutiful, forthright ruler of great personal courage. As a matter of fact, by leading a less conscientious political life, he might never have tasted the indignity of straight-jacket. On one occasion he placated rioting weavers, angry at the non-passage of a protective silk tariff, only to be tormented later by the thought that military action should have been taken against them.—Warner's *Calendar of Medical History*.



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PROBLEM OF IMPAIRED HEARING RESTS ON TREATMENT AND CURE

Emphasis in the problem of impaired hearing should be placed on treatment and cure rather than on prevention, according to A. C. Furstenberg, M.D., of Ann Arbor, Mich.

Writing in the September 21 issue of *The Journal of the American Medical Association*, Dr. Furstenberg states: "I have never been convinced of the truth of the often published statement that 75 to 80 per cent of all cases of impaired hearing are preventable, and that this large proportion of its victims could have avoided their affliction had it been identified early and had proper methods of prevention been instituted. How can one prevent a degeneration of the auditory nerves which often occurs as the result of severe toxic diseases? . . . How are physicians to keep the eustachian tubes of children in working order and the middle ears free from infection during the course of diseases which infect the upper respiratory tract, particularly measles, scarlet fever, mumps and whooping cough?"

World War II saw the first practical adoption of a program for the treatment of deafness. "I point with pride and with a deep sense of gratitude," the author writes, "to those far sighted and efficient representatives of the Army and Navy who created an epochal program of service by the establishment and efficient operation of four centers for the rehabilitation of the hard of hearing in military service. These important units located at strategic points in the United States, Deshon General Hospital at Butler, Pa.; Borden General Hospital at Chickasha, Okla.; Hoff General Hospital in Santa Barbara, Calif., and the U. S. Naval Hospital at Philadelphia, have done a colossal job and have achieved memorable progress in the care of the hard of hearing that will not fail to attain lasting recognition.

"The pioneers in this field wisely combined all available talents—those of the otologist, psychiatrist, psychologist, physicist, electrical and acoustic engineers and speech experts to function in an integrated and cooperative program that has rendered service of inestimable value to the unfortunate persons whose hearing was impaired in the line of duty.

"It remains now for civilian physicians and for public health and welfare agencies interested in this field to become familiar with the yeoman service of these great centers and to establish several more along similar lines, geographically located to render the greatest possible service to the people of this country. Unfortunately, progress in civic agencies is frequently slow, but the impetus given this magnificent program of service to the hard of hearing by military personnel is destined to inspire, if not demand, a similar plan of action in civilian life."

Barush Spinoza (1623-1677).—The skilled lens grinder, Baruch Spinoza, was frail and tuberculous, but his philosophy has had an enormous influence upon modern thought. Breathing glass dust by day, pouring nightly over his books, always closely confined, dieting in the hope of curing his illness, the constitution of Spinoza was soon worn down as surely and completely as the lens he ground by day. Death came before anyone realized how seriously ill he had been.—*Warner's Calendar of Medical History.*



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BERIBERI HEART DISEASE TEST OFFERED AFTER 5 YEAR STUDY

Four physicians who made a five year study of beriberi (a vitamin deficiency) heart disease at the Cincinnati General Hospital offer a new set of standards to aid in differentiating it from other types of heart disease which it closely resembles.

Writing in the June 29 issue of *The Journal of the American Medical Association*, the doctors—M. A. Blankenhorn, C. F. Vilter, I. M. Scheinker, and R. S. Austin, from the Departments of Internal Medicine, Neuro-pathology and Pathology, University of Cincinnati College of Medicine—recommend applying the following test:

(1) There must be insufficient evidence for any other cause; (2) a thiamine (vitamin B₁) deficient diet must

have existed for three or more months; (3) signs of nerve inflammation or of pellagra, another vitamin deficiency disease, must be present; (4) detection of an enlarged heart with normal heart rhythm; (5) presence of swelling; (6) high blood pressure; (7) minor electrocardiographic changes and (8) recovery with decrease in heart size or autopsy consistent with beriberi heart disease.

Beriberi is usually caused by a thiamine deficiency in the diet. It is prevalent chiefly in Japan, India, China, the Philippines and the Malay Peninsula. The disease is marked by spasmodic rigidity of the lower limbs, with a wasting of muscular tissue, paralysis, anemia and neuralgic pains.

During the five year study which the doctors began in 1940, they were able to recognize 12 cases of beriberi

(Continued on Page 64)

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BERIBERI HEART DISEASE TEST OFFERED AFTER 5 YEAR STUDY

(Continued from Page 60)

heart disease which conformed to the eight-point criteria which they recommend. Because the disease was first recognized in its late stages, five of the patients died in the hospital while one died after returning home. Rest and injections of large doses of thiamine were the mode of treatment.

Dietary deficiency, which was found in 11 patients, was directly ascribable to alcoholism, according to the article. "The majority of the diets, as far as assessment was possible, were deficient not only in thiamine but also in the other water soluble vitamins, particularly niacin, riboflavin [both portions of vitamin B complex]

and ascorbic acid [vitamin C]. One patient, though an alcoholic addict, had apparently been eating amounts of the essential nutrients which under normal conditions would have been adequate. 'This person, however, proved to absorb many substances poorly. In every instance the patient had been existing on a diet deficient in thiamine for longer than three months.'

In all 12 patients there was other evidence of nutritive failure, state the authors. Always there was some indication that the nerves near the surface of the skin were inflamed or that pellagra was present. In half of the patients both disorders were found. Eight of the 12 patients had anemia; nine were found to have an abnormally decreased amount of portein in their blood plasma. In addition, x-rays revealed an enlarged heart in 10 of the patients.

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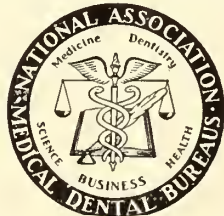
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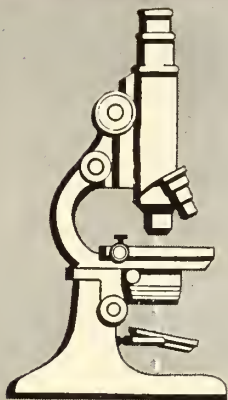
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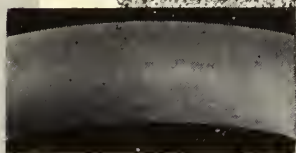
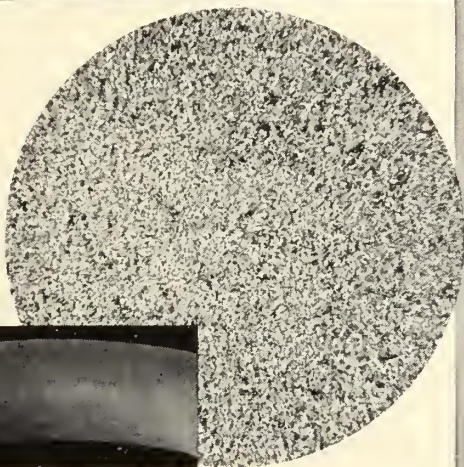
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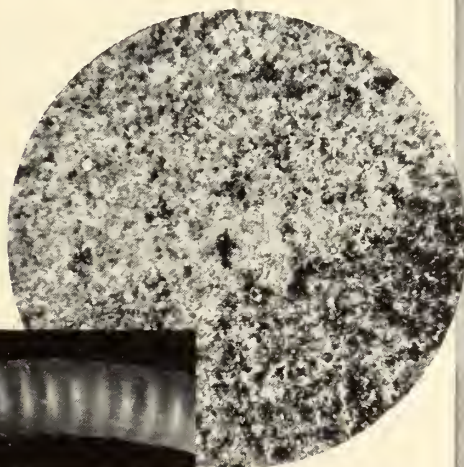
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Analysis of 402 Cases of Carcinoma of the Breast*

EVELYN SIRIS, M.D., AND LEONARD DOBSON, M.D., *San Francisco*

IN spite of the tremendous advance in breast surgery that took place with the introduction of the radical mastectomy by Halsted and Willy Meyer in 1889, and the refinements in radiation therapy during the past quarter century, we are still faced with the appalling fact that the mortality from carcinoma of the breast is increasing, that it was responsible for 10 per cent of the cancer deaths in the United States registration area in 1935. Spackman and Hynes¹³ estimate that 2 per cent of all females die of mammary cancer. These figures certainly drive home the fact that what is needed at present is a new fundamental approach—that there is no satisfactory solution to the problem until we have solved the riddle of cancer.

Mammary cancer is a disease that is localized early, that is soon widely disseminated both by the lymphatics and the blood stream, and whose tumor emboli may lie dormant for many years before becoming activated. What appears to be a primary operable case is frequently not so. Ewing⁴ has stated that a tumor under 2.5 cm. in diameter is rarely disseminated—but we seldom see them that small.

The great controversy today is over the management of primary operable carcinoma that has already involved the axillary nodes. There is fairly uniform agreement that the 70-80 per cent five-year salvage obtained in small movable lesions localized to the breast⁸—the anatomical stage I†—with immediate radical surgery is not significantly improved by the addition of irradiation. In anatomical stage II management, there is no such uni-

form agreement—neither first in defining an operable case with axillary involvement, nor, second, in the management of it. The scope of the surgeon's knife is gradually being narrowed. Factors which must be considered include the histologic characteristics of the tumor, the quadrant of the breast affected,² involvement of the skin, and degree of involvement of the axillary nodes. Warren and Tompkins¹⁵ found that their five-year arrements with surgery varied from 68 per cent to 19 per cent depending on whether only one or more than 50 per cent of axillary nodes were involved.

Bartlett found only 4 per cent of five-year arrests when the tumor was in the inner hemisphere, as contrasted with 32 per cent in the outer hemisphere. Harrington⁷ operates on any case "in which there is a reasonable chance for cure." Haagensen⁵ has neatly outlined what he believes are the criteria of operability—with which we are in full agreement. (Chart I.)

CHART 1.

HAAGENSEN-STOUT CRITERIA OF OPERABILITY— CONTRA-INDICATIONS⁵

1. When the carcinoma is one which developed during pregnancy or lactation.
2. When extensive edema of the skin over the breast is present.
3. When satellite nodules are present in the skin over the breast.
4. When intercostal or parasternal tumor nodules are present.
5. When there is edema of the arm.
6. When proved supraclavicular metastases are present.
7. When the carcinoma is the inflammatory type.
8. When distant metastases are demonstrated.
9. When any two, or more, of the following signs of locally advanced carcinoma are present:
 - (A) Ulceration of the skin.
 - (B) Edema of the skin of limited extent (less than one-third of the skin over the breast involved).
 - (C) Fixation of the tumor to the chest wall.
 - (D) Axillary lymph nodes measuring 2.5 cm., or more, in transverse diameter, and proved to contain metastases by biopsy.
 - (E) Fixation of axillary lymph nodes to the skin or the deep structures of the axilla, and proved to contain metastases by biopsy.

* From the Tumor Clinic, Stanford University School of Medicine, San Francisco.

† Anatomical Staging.

I. Small movable lesion localized to breast.

II. Movable lesion in breast with axillary metastatic nodes that are not fixed.

III. Fixed local lesion. Fixed axillary nodes. Extensive skin involvement. Spread of cancer beyond axillary nodes. Inflammatory carcinoma.

It is hard to decide what policy to adopt in regard to irradiation (preoperative and postoperative). Many statistical studies on this point are available. The criteria used are not uniform, and there is almost as much difference in percentage of success among different observers for each method of treatment as there is between different methods of treatment. (Table I.)

TABLE 1.—Recent 5-Year Survival Statistics (Arrests)

A. Radical Surgery Only.			
	No. Cases	Stage II	All Cases
Harrington ⁷ (1946)	5,407	30.4%	47.6%
Haagensen ⁶ (1942)	640	21.0%	36.1%
Adair ¹ (1943)	172	47.3%	63.0%
Portmann ¹¹ (1943)	?	50.0%	?
B. Pre-Operative Irradiation and Radical Surgery.			
Soiland ¹² (1942)	?	47.0%	47.0%
Pfahler ⁹ (1938)	97	53.5%	44.5%
Adair ¹ (1943)	582	35.3%	49.0%
C. Radical Surgery and Postoperative Irradiation.			
Pohle ¹⁰ (1942)	42	28.0%	?
Pfahler ⁹ (1938)	310	47.0%	47.5%
Evans, Leucutia ³ (1939)	302	?	50.0%
Portmann ¹¹ (1943)	?	65.0%	?
Strenstrom ¹⁴ (1945)	254	?	51.0%
Adair ¹ (1943)	277	41.8%	54.0%

POLICY AT STANFORD UNIVERSITY
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Stage I. The present policy at Stanford is immediate operation in all stage I and stage II carcinomas (except for constitutional contra-indications). If no cancer is found in the axillary nodes, nothing further is done unless recurrences appear.

Stage II. If cancer is found in the axillary nodes, postoperative irradiation is given, usually as soon as the sutures are removed.**

The entire hemithorax, including axilla, supraclavicular region, and mediastinum are irradiated to skin erythema—usually between 2,400 and 3,000 r as measured on the skin. The axilla and supraclavicular regions are cross-fired from behind to a total of 3,000 to 3,500 r. This course is not repeated. Further therapy is only in case of recurrences. In all women still menstruating, prophylactic roentgen castration is advised.

From about 1935 to 1940 we were giving all Stage II cases a trial of irradiation. If the tumor responded we carried the dose on to tolerance (usually between 3,500 r and 4,500 r in air to the tumor site) and rested with that, taking the sensitivity as a measure of anaplasia and presumptive operative incurability. But if after some 2,000 r the tumor had not responded, x-ray was stopped and radical operation done immediately. There were only 22 cases so handled.

Stage III. In Stage III, the treatment is highly individual, and almost always primarily irradiation. Simple or radical mastectomy is occasionally done later when all possible x-ray has been given and the controlled local lesion shows signs of regrowth. The few primary radical mastectomies done have convinced us of the folly of attempting this procedure.

Distant metastases and recurrent cases: X-ray therapy is first directed to control pain, and the local lesion is frequently a secondary consideration. Palliative irradiation has accomplished so much in so many patients that we find ourselves enthusiastic for more treatment in these cases however many times recurrent and widespread the metastases (especially skeletal). The only exception is in the case of hepatic metastases, for which not much relief can be hoped. In the younger group, roentgen castration has occasionally helped considerably.

ANALYSIS OF CASES

During the period of 1926-1945, 402 patients with carcinoma of the breast were seen in the clinics of the Stanford University Hospital. Clinically these were classified according to Steintal.*

The final classification, and that used in the tables, is anatomical, Stage II consisting of operable cases with axillary involvement. Stage III includes cases of inflammatory carcinoma, of marked skin involvement and/or local attachment, of fixed axillary nodes, and of supraclavicular extension. Stage IV consists of cases with distant metastases. Recurrent cases are those sent in for therapy after recurrence, the primary surgery having been done elsewhere.

Table II gives the distribution of our cases. Thirteen, or 4.3 per cent of our own cases, have been lost while living and well, the greatest number, seven, in Stage I. These have been omitted

TABLE 2.—Anatomical Stages, 402 Cases of Breast Carcinoma Seen in the Stanford University Hospital Clinics, 1926-1945

Stage	Number of Cases	Per Cent
I	90	22.4%
II	109	27.3%
III	83	20.6%
IV	27	6.7%
Recurrent	93	23.0%
Total	402	100 %
Paget's Disease	5	
Males	7	
Females	397	
Cases lost to follow-up	13	3.3% Total Cases 4.3% S.U.H.*
Total cases, 1926-41	319	
Total cases, 1941-45	83	
Total primary S.U.H. cases, 1926-41	229	
S.U.H. cases lost, 1926-41	11	
Died, intercurrent disease, 1926-41	16	

* Stanford University Hospital.

in computing Stanford survival statistics, though the 16 patients dying of intercurrent disease without evidence of cancer have been included in the gross Stanford survival statistics. Eighty-three cases of our total have been seen since 1941, and

** Based on the results of this survey routine post-operative roentgen therapy has been discontinued.

* We have not strictly adhered to the original Steintal classification, in Stage I, as regards size and rate of growth. Some of our tumors have been larger and have grown more rapidly than the original Steintal classification would admit.

319 cases up to 1941. Of these, 218 primary cases have been followed five years or more, and form the basis of our present report. Table III gives the age distribution, breast, and the quadrant distribution, when known. Table IV gives the duration of the tumor previous to therapy, where known. In our recurrent group, this data is frequently missing. As would be expected a larger

TABLE 3.—Age Incidence

Age	Per Cent
1-20	00.0%
21-40	14.6%
41-60	53.5%
61-	32.2%

BREAST INVOLVED	
Breast	No. of Cases
Right	202
Left	188
Bilateral	12

BREAST QUADRANT (S.U.H. Cases)	
Quadrant	No. of Cases
Upper outer	158
Lower outer	31
Upper inner	59
Lower inner	33
Unknown	28

TABLE 4.—Duration of Tumor Before Treatment

Time	Stage I	Stage II	Stage III	Recurrent
0- 6 mo.	54—61%	56—52%	34—35%	25
6-12 mo.	12	23	15	7
1-2 yrs.	9	18	15	7
2-3 yrs.	3	4	11	1
3-5 yrs.	9	2	11	2
5 yrs.	2	4	12	4

6.7% of patients had a tumor over five years before therapy.

percentage of Stage I cases were seen within six months than those in the other groups. Also 12 per cent of Stage I tumors were so slowly growing that the patient went three years or over before becoming alarmed enough to seek medical advice. Harrington⁷ found in his total of over 5,000 cases that 95 per cent of all Broders grade I and 64 per cent of all grade II were without axillary metastases when first seen, but these two groups comprise only 20 per cent of all cases.

Table V gives the distribution of patients in terms of treatment received.

TABLE 5

Total S.U.H.		Stage I	Stage II	Stage III, IV
Type of Treatment	Cases			
X-ray only	89	6	4	79
Radical only	128	72	46	10
Preoperative x-ray—				
Short	5	0	5	0
Heavy	18	3	7	8
Postoperative x-ray..	57	4	45	8
Simple mastectomy ..	3	2	1	0
Simple mastectomy with heavy preoperative x-ray....	3	0	0	3
Simple mastectomy with postoperative x-ray	5	3	1	1
Totals	308	90	109	109
Total radical mastectomies, S.U.H.—202.				

ANALYSIS OF RADICAL MASTECTOMIES

During the period of 1926-1941, 202 patients with carcinoma of the breast were treated on the Stanford Surgical Service by radical mastectomy. The operations were performed by different operators, the majority by the surgical residents.

The radical operation consisted in the removal of the entire breast, the skin overlying the breast, a much wider zone of the deep fascia, both pectoral muscles and the gland-bearing fat and areolar tissue from the axilla, all being removed together in one piece. In most instances the clavicular portion of the pectoralis major was preserved. In outlining the skin incision no consideration was given to the possibility of primary closure. If the skin could not be approximated without too much tension then the edges were sutured to the chest and a split skin graft was applied immediately to the raw surface. Early use of the arm was encouraged after the operation and the patients were out of bed within a week. The advantages of early activity are recognized and most of the patients are now ambulatory on the first postoperative day.

POSTOPERATIVE COMPLICATIONS

Table VI lists the postoperative complications of the 202 radical mastectomies. Three of the six deaths resulted from pulmonary embolism. One of the patients died while on the way home from the hospital, one died of a hemolytic streptococcus septicemia, one from active pulmonary tuberculosis and one from coronary thrombosis and a generalized peritonitis which resulted from the perforation of two acute ulcers of the colon.

TABLE 6.—Surgical Complications in 202 Radical Mastectomies

Complication	Cases
Deaths	6
Infected wound	18
Hematoma wound	3
Partial slough of skin flaps.....	34
Edema of arm.....	26
Limitation of motion of arm.....	6
Pneumonia	3
Thrombophlebitis	2

Causes of deaths (all autopsied)—

Pulmonary embolism	3
Septicemia	1
Pulmonary tuberculosis	1
Coronary thrombosis, perforated ulcer of colon with peritonitis	1

Most of the 34 cases listed as having sloughs of skin flaps had loss of small areas of skin, although some required secondary pinch or split grafts. In none of the 26 patients who developed swelling of the arm postoperatively was the edema severe enough to be disabling.

RECURRENCES

Although the majority of deaths from carcinoma of the breast result from widely disseminated metastases, especially to the lung, spine, pelvis and liver, we are especially interested in local and axillary recurrences. Table VII gives the incidence of regional recurrences in 149 cases followed more than five years after operation.

TABLE 7.—*Regional Recurrences in 149 Radical Mastectomies 1926 to 1941*

Site	Number	
Skin	24	16.2%
Axilla	14	9.4%
Supraclavicular	16	10.7%

A separate study was made of the sites of metastases in 375 cases, combining the cases treated by radical mastectomy alone with those receiving pre or postoperative x-ray therapy and those with recurrences who had been operated upon elsewhere. Table VIII gives the results of this study. The percentage of liver metastases is lower than that reported in autopsy series, probably due to the difficulty in palpating small nodules in the liver.

TABLE 8.—*Recurrences and Metastases in 375 Cases*

Site	Stanford 282	Recurrent	Total	
Lungs	62	22%	39	101
Pelvis	49	20%	28	77
Skin	27	9%	37	64
Spine	38	13%	23	61
Supraclavie	18	6%	25	43
Ribs	20	7%	20	40
Axilla	19	6%	20	39
Liver	19	6%	5	24
Pleura	11	4%	14	25
Skull	7	3%	5	12
Brain	9	3%	3	12
Extremities	7	2%	2	9

The clinical staging of the disease was important during the period of this series when Steintal II cases were given heavy preoperative irradiation. It is well known that there is a large factor of error in the accuracy of the clinical diagnosis of axillary node metastases. Harrington⁷ showed that 32 per cent of all patients with enlarged axillary nodes had no cancer within the axilla, while 29 per cent of those without clinically palpable nodes nevertheless had axillary metastasis. Haagensen and Stout⁶ in their study of 622 radical mastectomies found that the clinical diagnosis was wrong in 15.1 per cent of clinical Stage I and 44 per cent wrong in clinical Stage II. Table IX shows the comparison of the anatomical as against clinical classification in this series.

TABLE 9.—*Anatomical vs. Clinical Classification**

Anatomical	Clinical (Steintal)
Stage I..... 90	Stage I..... 79 (15 were II)
Stage II..... 111	Stage II..... 126 (26 were I)
Stage III..... 4	Stage III..... 0 (4 were III)
Anatomical I called Steintal II..... 26	28.9% error
Anatomical II called Steintal I..... 15	13.6% error

We were interested in seeing if our regional recurrences were any less in cases treated with pre or postoperative therapy. (Table X.) All regional recurrences are lower in postoperative irradiated cases, even lower than in our Stage I cases. Nodule recurrences are less in preoperative irradiated cases, but this series is quite small. Table XI gives our crude and net five-year sta-

tistics, irrespective of treatment. Of our five-year arrests, 31 per cent later had recurrences. Contrasted to our low overall survival figures are those with radical surgery alone. Here, 48.5 per cent is our lowest possible figure. Of course this is a select group in which only ten cases were in Stage III.

TABLE 10.—*Regional Recurrences in 140 Radical Mastectomies Followed 5 Years or Died with Carcinoma*

Anatomical Stage I.				
	Radical Mastect.	Preop. X-ray	Postop. X-ray	Total
Treatment cases	42	3	3	48
Skin	18 %	33 %	0	18 %
Axilla	4.4%	0	0	3.7%
Supraclavicular	0	0	0	0
Anatomical Stage II.				
	Radical Mastect.	Preop. X-ray	Postop. X-ray	Total
Treatment cases	35	10	25	70
Skin	20 %	20 %	12%	17 %
Axilla	17 %	10 %	12%	14 %
Supraclavicular	33 %	0 %	24%	22.4%
Anatomical Stage III.				
	Radical Mastect.	Preop. X-ray	Postop. X-ray	Total
Treatment cases	9	9	5	22
Skin	11 %	12.5%	40%	18 %
Axilla	0	12.5%	20%	9 %

TABLE 11.—*Five Year Survivals, 1926-1941*

No. Cases	S.U.H. Only	Total Cases	Only Radical Mastect.
Total survival	218	319	97
Crude survival rate.....	84	102	52
Net survival rate.....	38.5%	32.0%	53.6%
Total arrests	41.2%	33.1%	60.0%
Crude arrest rate.....	71	84	51
Net arrest rate.....	32.5%	26.5%	52.2%
Assuming all cases with radical mastectomy only who are lost, died with disease, crude arrest, is still	35.0%	27.2%	59.1%
			48.5%

Table XII breaks down our survival rates into anatomical stages. Our overall crude five-year arrest is 47.5 per cent in Stage II, our survival 56 per cent. Forty per cent of our arrests later had metastases. We further analyzed our cases to see how sub-groups in the same stage compared with each other. These results are net results.

TABLE 12.—*Analysis of Five Year Survival Rate*

	Stage I	Stage II	Stage III, IV	Re- current
Cases	62	67	89	90
Crude survival rate.....	58.0%	56.5%	11.1%	31.0%
Net survival rate.....	64.1%	62.0%	11.8%	...
Crude arrest rate.....	53.1%	47.5%	6.7%	14.4%
Net arrest rate.....	59.0%	52.0%	7.1%	...
Per cent of 5 year arrests with later metastases	24.0%	40.5%	33.0%	100 %

Table XIII analyzes our Stage I. Our five-year results with surgery only could be better. The series treated with additional radiation are small and not significant. We expect Stage I to do well. The only value of bringing in our current cases here is for study of the trend. Some of these cases are only several months shy of the five-year goal.

All of them are at least nine months postoperative. We can yet hope this five-year group will do

TABLE 13.—Five Year Survivals—1926-1941—Stage I

Cases	5 Year Survival	5 Year Arrest	5 Year Arrest with Later Metast.
X-ray only 5	2—40%	1—20%	0
Radical mastect. . . 42	27—64%	27—64%	7—26%
Preop. x-ray heavy 3	3—100%	2—67%	0
Postop. x-ray 3	3—100%	3—100%	0
Simple mastect. . . . 3	1—33%	0—0	0

better than the previous one. Table XIV analyzes our group in Stage II. In our ten cases treated moderately or heavily with preoperative irradiation we have only 20 per cent five-year cures. However, our cures, contrasting the surgical with the postoperative x-ray cases, shows those with surgery alone to have done better. True, this series is small. But, in our current group, of which over half have already gone three years, the best we can hope for is 57 per cent, and it is probable that the complete five-year total will not be over 50 per cent.

TABLE 14.—Five Year Survivals—1926-1941—Stage II

Cases	5 Year Survival	5 Year Arrest	5 Year Arrest with Later Metast.
X-ray only 4	0	0	0
Radical only 35	24—68%	23—66%	11—48 %
Short preop. x-ray 5	2—40%	1—20%	0
Heavy preop. x-ray 5	2—40%	1—20%	0
Postop. x-ray 11	7—63%	6—54%	1—16.5%
CASES 1941—46			
Radical Mastectomy . . . 4	4—100 % living and well		
Heavy preop. x-ray 1	1—100 % living and well		
Postop. x-ray 33	19—57.5% living and well		
5 year arrest with surgery and surgery plus irradiation			55%

Table XV analyzes our Stage III and IV. Those treated with x-ray alone gave about 9 per cent survival. Twenty-seven of these were far advanced when first seen. All cases treated with primary surgery died soon. We can actually put both the simple and the radical mastectomies after heavy irradiation into the same group, as both of these groups were considered primarily inoperable, and operations was done only after the local lesion gave some evidence that it was no longer being controlled. These are our best results in Stage III.

TABLE 15.—Five Year Survivals—1926-41—Stage III and IV

Cases	5 Year Survival	5 Year Arrest	5 Year Arrest with Later Metastases
X-ray only . . . 66	6—9.1%	1—1.6%	0
Radical mastect. . . 9	0	0	0
Preop. x-ray heavy 8	4—50.0%	2—25.0%	0
Postop. x-ray . . . 0	0	0	0
Simple mastect. long after heavy irradiation 3	3—100 %	3—100 %	1—33%

Other small items of interest that came to light in this study are as follows:

1. Twenty-two of our patients had a history of some type of quack therapy before coming to us.

2. Twelve and seven-tenths per cent of our patients have a family history of cancer, but this is not always mammary cancer.

3. We could get no adequate history of estrogen therapy. Our cases receiving such therapy after operations were dead within a year. One case with a history of heavy estrogen therapy previous to surgery is arrested five years later.

4. Twenty-seven patients were prophylactically castrated. Five were without disease less than two years. Five were Stage I and without disease three years or over. Of the remaining 17, 12 had recurrences within 24 months. Eight of these latter cases were Stage II.

DISCUSSION AND SUMMARY

Under a policy of operating on all breast cancer in Stages I and II, and giving postoperative irradiation to those in which axillary metastases are found, the experience of the past 19 years has been analyzed.

Of Stage I so treated, 64 per cent were arrested for five years. The recurrences, early and late, were nearly half in the skin and more than a tenth in the axilla. This suggests that our criteria for staging were not followed rigidly enough and/or also that microscopic examination of the axillary nodes was not searching enough. Of the 44 Stage II cases given postoperative x-ray, only 11 have been followed five years, with 54 per cent of arrests. The group is too small to be dependable. Our present five-year group will do no better.

Before 1940 there were 35 Stage II cases treated by radical mastectomy only. A third of these recurred within five years, another third stayed well, but the last third went on to late recurrence. Our more recent cases given postoperative x-ray have not had time to reveal the full weight of such late recurrences. For a few years before 1941 we have a small experience of preoperative irradiation in clinical Stage II and selected Stage III (three proved after all to be only Stage I). Lumping the Stage II's and Stage III's together, the 21 cases yielded only seven five-year arrests (including three late simple mastectomies in cases initially well controlled by x-ray). These results are not good enough to make us try further any program of routine preoperative irradiation in Stage II. Stage III cases have given us only two five-year arrests in 75 cases (by x-ray irradiation) but many lived in fair comfort with their disease for several years (five of them for five years).

Skeletal metastases are frequent from cancer of the breast and can be a disaster for the patient, with severe pain and disabling fractures. The beneficial effect of x-ray in these cases has been to us outstanding. Many are temporarily restored to comfort and subjective health. We are also ready always to try x-ray and more x-ray on local and pulmonary and cerebral metastases. Liver metastases have responded less well, perhaps be-

cause of the sickness produced by significant x-ray dosage delivered in this region.

On the basis of this study we have discontinued the use of pre and postoperative irradiation in operable breast cancer. We continue to be very enthusiastic for the use of x-ray in holding incurable breast cancer in check and relieving the patient of the miseries of the disease for months and years.

CONCLUSIONS

1. Patients with carcinoma of the breast in Stages I and II should be treated by surgery only.
2. Those with recurrences should be treated by irradiation when the recurrence appears.
3. Cases in Stage III should all be treated by irradiation primarily.

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DDT—A POWERFUL WEAPON AGAINST INSECT-BORNE DISEASES

With the advent of DDT in the United States in 1943 a powerful weapon was launched against insect-borne diseases, according to an article in the November 2 issue of *The Journal of the American Medical Association*.

The author—Col. William S. Stone, M.C., Army of the United States—states that this insecticide will kill the anopheles mosquito which transmits malaria, the flea which transmits plague, the louse which transmits typhus and the fly which transmits dysentery and which may be a carrier of infantile paralysis.

Colonel Stone points out that "the nation now has within its grasp not only means to effectively control louse and flea-borne typhus fevers and the fly transmissions of the dysenteries but also improved methods for controlling malaria, leishmaniasis [a disease causing ulceration of the mucous membranes of the nose and throat], dengue [a fever], pappataci fever [also called sandfly fever] and filariasis. Progress has been made in controlling mite-borne diseases, and a lead has been obtained on how to control plague. There must be a continuation and extension of these efforts, and soon it should be possible for human beings to live in all parts of the earth without fear of insect-borne diseases."

DDT is manufactured in dry powder form, as a water-base spray and in a kerosenelike base. "In using DDT as an insecticide," the author writes that "it must be remembered that it is slow to act, with a knockdown varying from a few minutes to more than one hour; most insects showing evidence of DDT poisoning die, and its chief advantage over other insecticides is that on proper application to a surface it continues to be a

potent contact insecticide for as long as three or four months. This latter property obviously has great significance in any insect control program."

In spite of the wide use of DDT and the poisonous effect it has on insects there have been "no clearcut cases of human poisoning" seen in the United States, according to Dr. Paul A. Neal of the National Institute of Health. Although a few persons have become ill, Dr. Neal said that it was due to the solvent or base and not to the DDT itself.

The compound, now commonly known as DDT, was first synthesized by a German chemist in 1874 and was patented as an insecticide in Germany in 1934. "In 1939," Colonel Stone states, "J. R. Geigy, Inc. of Basle, Switzerland, investigated its insecticidal properties for the control of clothes moths and certain agricultural pests. They also noted some of its residual insecticidal action after its application to a surface. During December of 1942 and early in 1943, studies conducted at the Bureau of Entomology, U. S. Department of Agriculture Laboratory at Orlando, Fla., confirmed the Swiss work and extended the information on the use of DDT as an insecticide with long lasting residual effect. This information was immediately applied to the development of materials and methods for the control of lice, mosquitoes, flies, fleas, sandflies, mites, bedbugs, cockroaches, clothes moths and many other insects of economic importance."

Its first use was to fight insect-borne diseases at the fighting fronts. The author concludes that "thus the necessity of war has contributed materially to peacetime living."

Diagnostic Problems in Luetic Cardiovascular Disease*

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I. GENERAL CONSIDERATIONS: The prevention of cardiovascular syphilis is the prevention of syphilis itself. In 1929 Bruusgaard³ reported that of 473 patients who had received no anti-luetic treatment, 10 per cent had developed clinical evidences of cardiovascular lues. The average duration of syphilis in this group was 20 years. These data are in agreement with those of Turner,¹⁷ who made a similar analysis of approximately 6,000 cases of late untreated syphilis at the Johns Hopkins Clinic. In 1937, Kemp and Cochems⁴ reported an incidence of 12.7 per cent of cardiovascular involvement in a series of 1,000 luetics. There is abundant evidence in the literature to show that clinical involvement of the cardiovascular system will develop in approximately 10 per cent of untreated or inadequately treated cases of acquired syphilis. Post-mortem examinations reveal that in all instances where a pathological diagnosis of late syphilis can be established, 70-90 per cent of the subjects show evidences of cardiovascular lues.^{5,18} Although these figures are based primarily upon microscopic changes, they serve to emphasize to the clinician the importance of being on the alert for signs or symptoms referable to the cardiovascular system in the patient afflicted with lues. From the very beginning syphilis is a vascular disease. Much has been written on the pathology of syphilis, particularly with respect to its protean manifestations, its predilection for the supralvalvular portion of the ascending aorta, and its tendency to produce low-grade inflammatory changes in the media and adventitia of the ascending, transverse, and less frequently, the descending limb of the aorta.⁸ The earliest involvement of the aorta is due to low-grade inflammatory processes in the adventitia and media of the ascending aorta not attended by gross anatomical alterations or symptoms. Secondly, there may be sufficient involvement of the elastica to account for dilatation of the aortic wall. Thirdly, there may be local destruction of the elastica followed by the formation of an aneurysm. Fourthly, the supralvalvular portion of the aorta may undergo lowgrade inflammatory changes, with resultant fibrosis and scarring of the valve leaflets or there may be sufficient retraction of the valve leaflets to produce frank aortic insufficiency. Lastly, there may be narrowing of the coronary ostia as a result of the progressive fibrotic changes which have occurred in the walls of the aorta.

After varying lapses of time, these changes or any combination of them may follow the initial infection. In general it is believed that the diagnosis of cardiovascular syphilis becomes recog-

nizable about 10 to 30 years after the primary infection. Furthermore, it must be remembered that approximately 50 per cent of the clinically detectable lesions of late syphilis are referable to the cardiovascular system.

The importance of establishing the diagnosis of luetic cardiovascular disease at the earliest possible time has been emphasized by several investigators,^{9,10,12,16} and the effect of instituting early treatment is best summarized by Moore⁸:

The Incidence and Prognosis of Life Span in Patients with Various Types of Cardiovascular Complications in Late Syphilis.

Clinical Type	Percentage of Patients Affected	Prognosis	
		Untreated	Treated
Uncomplicated aortitis clinically unrecognized ...	70-90	Good	Excellent
Uncomplicated aortitis, recognizable on basis of symptoms and signs....	5-10	5-10 years	10-20 years
Aortitis with saccular aneurysm	1-2	1-2 years	5-10 years
Aortitis with aortic regurgitation	2-3	2-3 years	4-10 years

Many criteria have been given in order to evaluate the various signs and symptoms of uncomplicated aortitis.^{1,2,7,10,11,13,14,15} The relative importance of these varies from observer to observer. In regard to the order of frequency and importance, uncomplicated luetic aortitis may be diagnosed when: (1) There is roentgenographic evidence of aortic dilatation; (2) The aortic second sound is hollow or of tambour quality; (3) There is dyspnea; and (4) There is sub-sternal pain. In addition the patient should be under 40 years of age, free of hypertension, arteriosclerosis and other cardiovascular diseases which might produce identical signs and symptoms.⁶ On the other hand the diagnosis of frank aortic insufficiency or of aneurysm seldom proves difficult.

II. ORGANIZATION AND PURPOSE OF THE LUETIC CARDIOVASCULAR CLINIC. In 1939, a special cardiovascular clinic for luetic out-patients was organized at the University of California. It was conducted by three full-time members of the medical staff in cooperation with the director of the clinic for luetics. Its purposes were to provide a diagnostic and advisory center, a uniform type of examination, a uniform type of record, and to make data available for teaching and research purposes. It was the intention of the group to give special consideration to the criteria suggested above and to determine to what extent it would be possible to make reliable diagnoses of early cardiovascular lues under the usual conditions found in

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an out-patient department. Ideally all patients who were seen in the clinic for luetics would be referred to the cardiovascular clinic and thus provide unselected material for statistical evaluation of diagnosis and treatment during the ensuing years.

The examination form used in the clinic was designed to obtain a complete cardiovascular history on each patient, with especial reference to the presence of pre-cordial pain, dyspnea, hemoptysis, cough, sputum, hoarseness, vertigo, edema, palpitation, indigestion, insomnia, weakness or other symptoms referable to the cardiovascular system. Space is provided on the form for the following special observations in the physical examination: the point of maximum intensity, the area of cardiac dullness (right border and left border), area of the base, thrills, murmurs, character of heart sounds including the aortic second sound, rate, character and rhythm of the pulse, blood pressure in each arm, and signs of arteriosclerosis. Provision is made for recording notes on the presence of the following: occlusion of peripheral vessels, episternal notch pulsation, diastolic shock, capillary pulsation, visible arterial pulsation and femoral pistol shot sounds. At the bottom of the form are listed the results of the teleroentgenogram, fluoroscopy and electrocardiogram, followed by the diagnosis and recommendations for treatment.

At the completion of the examination, a working diagnosis was made, and recommendations for treatment were suggested to the staff in charge of the treatment of luetic patients. Adequate clinical follow-up was to be provided by scheduled return appointments for all patients examined in the luetic cardiovascular clinic.

III. ANALYSIS OF DATA. During the five-year period covered by this study, approximately 2,000 patients were seen in the Luetic Clinic, and of these, 355 were given the cardiovascular examination as outlined in the special clinic. Therefore, it was impossible to make an accurate statement concerning the incidence of luetic involvement of the cardiovascular system in patients afflicted with syphilis. Those patients who were examined represented neither a random nor a selected sample of the population at risk.

In figures 1 and 2 are shown the age distribution of the patients seen in the luetic cardiovascular clinic. The majority of patients fell within the age group of 35 to 60 years. Of the total number of women, 71 per cent of the afflicted were over 40 years of age; and among the males, 85 per cent were over 40 years of age. Of the total afflicted subjects, less than one-third were women.

In figure 3 is given the number of sero-positive patients (132 or 34 per cent) in whom the diagnosis of no cardiovascular disease was made. The majority of these fell within the age group of 30 to 55 years. In general, those sero-positive patients having no cardiovascular disease tended to be younger than those sero-positive patients in whom the diagnosis of arteriosclerotic or hypertensive heart disease occurred (figure 4). The

latter group comprised 114 cases or 29 per cent of the total. The major portion of these patients were between the ages of 45 and 65 years.

In figure 5 is demonstrated the incidence of the diagnosis of luetic cardiovascular disease of all types—136 cases or 35 per cent of the total. This graph demonstrates that in the age groups under consideration, luetic cardiovascular disease occurs most frequently in those age groups which also suffer from the highest incidence of arteriosclerotic or hypertensive heart disease. In other words, with rare exceptions, it is uncommon in this series of observations to find patients with luetic cardiovascular disease unaccompanied by

Luetic Cardiovascular Clinic ~ 1939-1944

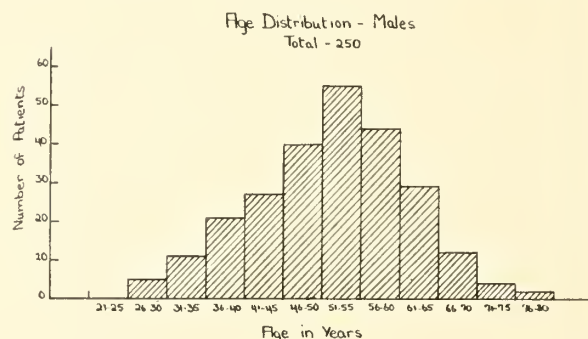


FIGURE 1

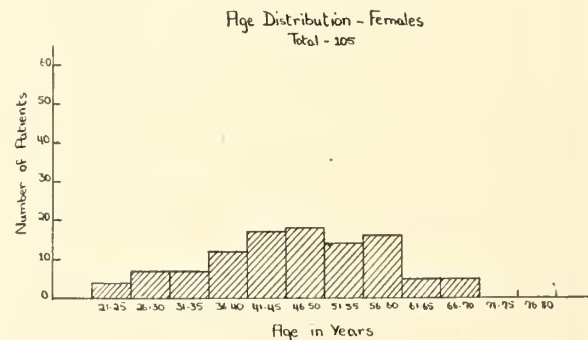


FIGURE 2

Incidence of Sero-Positive Patients
Diagnosed as Having No Cardiovascular Disease
Total: 132 cases ~ 34% of 355 cases

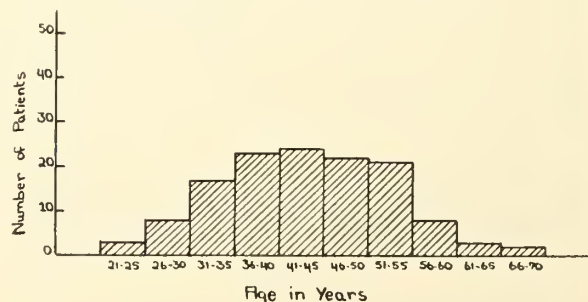


FIGURE 3

Incidence of Diagnosis of
Arteriosclerotic or Hypertensive Heart Disease
in Patients Having Serological Lues
Total: 114 cases ~ 29% of 355 cases

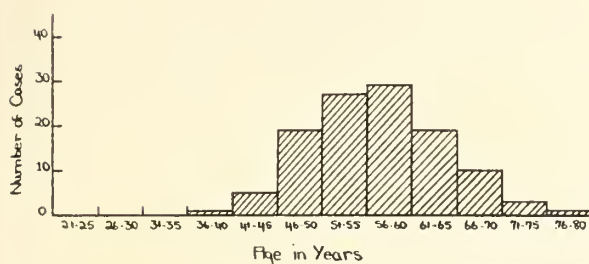


FIGURE 4

Incidence of Diagnosis of
Luetic Cardiovascular Disease—All Types
Total: 136 cases ~ 35% of 355 cases



FIGURE 5

arteriosclerotic or hypertensive changes. As has been stated before, these latter changes may produce signs or symptoms which fulfill the criteria designated for luetic aortic involvement.

In Table I is recorded the distribution of diagnoses for the total group of 353 patients (one patient having been omitted because of congenital lues, and one because of a complicating mediastinal tumor). Since in many patients there was more than one diagnosis, the total number of

VARIETY OF CARDIOVASCULAR DIAGNOSES
IN GROUP UNDER STUDY - 353 PATIENTS

Diagnosis	Number of Cases	% of Total Diagnoses
Luetic Aortitis	33	9
Aortic Insufficiency	40	10
Aortic Aneurysm	63	16
Mixed Valvular Disease	6	2
Hypertension and/or Arteriosclerosis	114	29
No Cardiovascular Disease	132	34
Total Diagnoses	388	

Table I

diagnoses (388) exceeds the total number of patients (353). Of the total diagnoses 34 per cent are listed as having no cardiovascular disease; 29 per cent as having hypertensive or arteriosclerotic heart disease; and 35 per cent as having luetic cardiovascular disease—and of these 9 per cent luetic aortitis, 10 per cent aortic insufficiency, 16 per cent aortic aneurysm, and 2 per cent were listed as having rheumatic heart disease with mixed valvular lesions.

In Table II is shown the age distribution of the three primary luetic cardiovascular diseases: aortitis, aortic insufficiency, and aortic aneurysm. It will be noted that the graver forms of luetic cardiovascular disease occur in the progressively older age groups and that the highest incidences occur after the age of 40 years. These data provide further evidence of the part which arteriosclerosis and hypertension plays in the onset of luetic cardiovascular disease.

In Table III is given the incidence of cardiovascular disease with respect to the time interval elapsing between the primary luetic infection and the date of observation. Of the total 355 subjects, 56 per cent had no knowledge of the date of infection, a figure in agreement with that of most observers. There appears to be very little difference in the interval of lapsed time between the primary infection and the onset of cardiovascular signs or symptoms in the group suffering from luetic cardiovascular disease when contrasted with the group suffering from arteriosclerotic or hypertensive heart disease.

It is possible that the incidence of cardiovascular disease, whether luetic, arteriosclerotic or hypertensive, may be a function of age rather than of duration of the infection. The exception to this statement appears to be in the group diagnosed luetic aortitis, where 18 per cent of the cases had a lapse of 11 to 15 years before the onset of cardiovascular symptoms. According to the criteria set down, aortitis is the most difficult to diagnose and hence the most likely to be over-diagnosed.

In Table IV the presenting complaints of all patients are listed according to diagnoses. As might be expected, those patients diagnosed as having no cardiovascular disease had fewer symptoms than those in the other diagnostic groups. The two most common complaints for all groups were dyspnea and chest pain, and these symptoms occurred more frequently in those patients who suffered from luetic cardiovascular disease.

In Table V the prominent physical findings of 347 patients are recorded according to diagnosis. Here again there have been multiple diagnoses on certain patients, and therefore the total number of diagnoses exceeds the total number of cases. Cardiac enlargement was observed in 39 per cent of patients having a diagnosis of aortitis, in 57 per cent with a diagnosis of aortic insufficiency, in 43 per cent with aortic aneurysm, in 25 per cent with arteriosclerosis or hypertension, and in 2 per cent of patients thought to have no cardiovascular disease. A tambour aortic second sound was encountered rather frequently in subjects suffering

AGE INCIDENCE OF LUETIC CARDIOVASCULAR DISEASE

TOTAL: 136 CASES - 35% OF 355 CASES

Diagnosis	No. of Cases	Percent of Cases by Age Group										
		21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75
Luetic Aortitis	33		3	3	12	21	18	15	18	9		
Aortic Insufficiency	40		5	2	8	12	20	20	12	12	8	
Aortic Aneurysm	63				3	14	16	16	29	11	8	3

Table II

INCIDENCE OF CARDIOVASCULAR DISEASE

WITH RESPECT TO INTERVAL ELAPSING FROM PRIMARY LUETIC INFECTION

Diagnosis	No. of Cases	Percent of Cases by Years Elapsed									
		1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	Unkn.
Luetic Cardiovascular Disease (All Types)	136	2	2	7	7	3	11	6	6	5	50
Luetic Aortitis	33	6	-	18	9	3	12	3	3	3	42
Aortic Insufficiency	40	2	2	5	5	5	8	10	5	8	50
Aortic Aneurysm	63	-	3	2	8	2	12	5	6	6	55
Arteriosclerosis and/or Hypertension	114	4	4	3	5	6	9	5	4	-	60
No Cardiovascular Disease	132	7	9	8	3	8	4	1	1	-	59
Total Diagnoses	382										
Total Cases	355	5	5	6	6	6	8	4	3	1	56

Table III

PRESENTING SYMPTOMS AND COMPLAINTS

Symptom	Percent Distribution by Diagnosis				
	Aortitis (33 Cases)	Aortic Insufficiency (40 Cases)	Aortic Aneurysm (63 Cases)	Arteriosclerosis and/or Hypertension (114 Cases)	No Cardiovascular Disease (132 Cases)
Dyspnea	76	50	54	40	30
Chest pain	39	32	46	20	11
Palpitation	36	42	36	29	17
Cough	21	17	25	2	9
Edema	3	10	10	1	7

Table IV

from aortic aneurysm, aortitis, and arteriosclerosis and hypertension. Eleven per cent of those having no cardiovascular disease were described as having a tambour aortic second sound. The "to and fro" murmur was found most frequently (75) in the cases of aortic insufficiency. In those instances where the "to and fro" murmur was observed in patients with aortitis, a coincidental diagnosis of aortic insufficiency was also made. The aortic systolic murmur has been established as one of the criteria for the diagnosis of luetic aortitis. In this series of observations, the aortic systolic murmur occurred in 30 per cent of patients diagnosed as having luetic aortitis, in 36 per cent diagnosed as having aortic aneurysm, and in 33 per cent diagnosed as having arteriosclerosis or hypertension. It is clear, therefore, that the use of this isolated clinical finding as a means of differentiation between those conditions is not sound. Moreover, 8 per cent of patients who had no demonstrable cardiovascular disease exhibited an aortic systolic murmur as an isolated finding. Signs of arteriosclerosis were evident in a high percentage of all cases except in those having no cardiovascular disease. A dilated aorta was noted fluoroscopically in 60 per cent of the patients diagnosed as having aortitis, in 52 per cent of those with aortic insufficiency, in 62 per cent of those with aneurysm, and in 64 per cent of patients with arteriosclerosis or hypertension. These

data render this isolated sign of doubtful pathognomonic significance for any single diagnostic category. During the period of observation there were differences of opinion as to the presence or absence of a dilated aorta, whether or not the aortic second sound was of tambour quality, and whether or not these changes were due to arteriosclerosis or lues, or in some instances to hypertension.

Fifty-five patients were given yearly cardiovascular examinations while under treatment and in none of these was there demonstrated any regressive changes in the cardiovascular status.

COMMENT

In a group of 355 patients observed in a luetic cardiovascular clinic, the age distribution was such that arteriosclerotic changes in the cardiovascular system made the diagnosis of early luetic aortitis practically impossible. The objective criteria for the diagnosis of luetic aortitis may also be fulfilled by hypertensive and arteriosclerotic heart disease without lues, and unless these conditions can be eliminated, the diagnosis of uncomplicated luetic aortitis under average circumstances cannot be made with any degree of assurance. The prevention of the cardiovascular complications of lues is best accomplished by the early adequate treatment of the primary infection.

CHIEF PHYSICAL FINDINGS Total Cases 347

Physical Signs	Percent Distribution by Diagnosis				
	Aortitis (33 Cases)	Aortic Insufficiency (40 Cases)	Aortic Aneurysm (63 Cases)	Arteriosclerosis and/or Hypertension (114 Cases)	No Cardiovascular Disease (132 Cases)
Cardiac Enlargement	39	57	43	25	2
Tambour A ₂	39	17	44	33	11
Aortic Murmur: To and fro	33	75	21	2	-
Systolic	30	-	36	33	8
Diastolic	12	25	6	2	1
Signs of Arteriosclerosis	70	68	63	100	19
Dilated Aorta	60	52	62	64	5

Table V

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Physiology of Traumatic Reflexes and Respiration During Surgical Anesthesia*

OBSERVATIONS MADE UNDER PENTOTHAL AND LOCAL NERVE BLOCK

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THIS report is based on a succession of clinical observations made during the past two and a half years, in which time the combined use of intravenous pentothal sodium and local nerve block provided the anesthesia of choice for 70 per cent of general surgical cases. Admittedly this present work reflects the viewpoint and perspective of the surgeon. For this reason the indulgence of the professional anesthetist is asked for any gross shortcomings in the accompanying interpretation of physiologic phenomena. The facts, nevertheless, are distinct and stand by themselves.

There is, however, a certain advantage in the surgeon's approach to the problem of the physiology of surgical anesthesia. The surgeon is in a position to continue and project into this clinical field his background of training in experimental physiology; he may at once initiate, observe and record variations in physiologic response to surgical trauma; he may at will functionally denervate with injections of procaine, selected neurogenic areas, thus eliciting contrasting physiologic responses from which he may bring evidence to bear on the problem of specific pathways of nerve impulse conduction. With these potentialities at hand, the surgeon should contribute largely to the basic problem of the physiology of surgical anesthesia.

The introduction of intravenous pentothal sodium anesthesia by Lundy a decade ago contributed not only a new agent of great value, but it provided also a new opportunity for the study of the physiology of surgical anesthesia. This enlarged opportunity is based on the selective pharmacologic action of the drug. Pentothal sodium exerts its major depressing effect on the cerebral cortex and on the thalamus. It thus in effect estab-

lishes a functional decerebration of the surgical patient. The physiologic status of the patient under pentothal sodium anesthesia is quite comparable from the viewpoint of reflex studies, to the surgically decerebrated animal. By virtue of this restricted primary local pharmacologic action at and above the level of the thalamus, all reflex arcs between the vital centers in the bulb (i.e., respiratory center) and the periphery remain intact. The additional graded depressing action of this drug on the respiratory center in the medulla, and its concomitant lack of action on the conduction pathways of the nervous system below the bulb, create a unique opportunity for accurate estimation of the interrelationship existing between peripheral traumatic stimuli of surgical origin and observable respiratory responses.

This situation with pentothal anesthesia stands in sharp contrast with the condition prevailing under ether anesthesia. With ether the conduction pathways distal from the bulb are depressed even to the point of establishing paralysis in the areas of distribution of the intercostal nerves. Also the local irritation of the air passages by ether fumes initiates afferent impulses in the pulmonary vagal reflex arcs which strongly stimulate respiration and distort completely the picture of simple traumatic reflex stimulation of respiration. Spinal anesthesia by its massive point suppression of afferent impulses at the juncture of the peripheral nerves with the spinal cord, eliminates all possibility of central conduction of nerve impulses of peripheral origin, thus abruptly terminating any possibility of studying such reflex actions. Regardless of the opinion which one holds concerning the value of pentothal sodium as a general anesthetic agent, the drug does provide an approach to the study of the physiology of anesthesia during the course of surgical procedures which is not equaled by any other anesthetic agent.

The identification of surgical trauma as the

* Read before the Section on General Surgery in joint meeting with the Section on Anesthesiology at the Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

principle causative factor in the reflex stimulation of respiration during surgical procedures which stems from this study, is in accord with the recent emphasis placed by many students on the importance of the neurogenic control of respiration as contrasted with its chemical control. The present study may be said to extend the observation made by the Swedish anesthetist Gordh to the effect that the physiology of respiration dominates the physiology of anesthesia. From this present study a more comprehensive concept may be enunciated to the effect that, disregarding the problem of pain control and of muscular relaxation, the physiology of surgical anesthesia resolves itself into the question of the momentary balance between the reflex stimulation of respiration by afferent pain impulses of traumatic origin and the depressing effect of the anesthetic agent on the stimulated respiratory center. This balance will be distorted or altered by the specific stimulating effect of inhalation anesthetic agents on the pulmonary vagal reflex arcs, or by the specific depressing action of an anesthetic agent on the conduction pathways of the nervous system distal to the bulb (ether, cyclopropane and spinal procaine).

METHOD

Two general approaches were utilized in the present effort to unravel the physiology of surgical anesthesia. First, a series of quantitative studies were carried out based on the rate of utilization of pentothal per minute in 200 major surgical procedures in which a detailed record of utilization and of other pertinent data was accurately kept. This group was supplemented by an additional group of 200 to 300 selected cases bearing on specific problems noted in the analysis of the original 200 cases. Analysis of the rate of utilization of pentothal per minute was made with reference to age, sex, weight, length of operation, type of operation, and the effect of procaine block interruption of afferent nerve impulse conduction. The record of the rate of utilization per minute was kept in blocks of ten-minute periods for the entire surgical episode. Such charting of the rate of utilization in blocks of ten minutes makes possible an accurate correlation between changes in the rate of utilization of pentothal and sources of surgical trauma during the progressive technical phases of an operation.

The second method of study was that of pneumographic recording of specific responses by the respiratory mechanism to controlled selected types of surgical trauma. By use of pneumograms the intensity and the specific character of the respiratory response could be precisely analyzed with reference to the anatomic plane or the neurologic field of origin of the stimulating surgical traumata. Procaine blockage of afferent nerve impulses again verified the assumption of a causal relationship between specific forms of surgical trauma and respiratory stimulation by obliterating in the pneumograms the specific respiratory responses.

QUANTITATIVE STUDIES

An analysis of the rate of utilization of pentothal in the 200 successive detailed cases showed that the two most important factors bearing on the rate of utilization of the drug are the duration of the operation and the type of the operation. When proper adjustment was made for the factor of duration as between long operations (over an hour) and short operations (under one hour), the factors of weight, sex and age had no important bearing on the rate of utilization of the drug. The single exception to this generalization is that there did appear to be a distinct reduction in the rate of utilization of the drug after 60 years of age.

The importance of the duration of an operation on the rate of utilization of the drug appears to be related to two facts: first, to the proportionately greater weighting of the averages for short operations by the initial, large induction dose than would occur in the averages for long operations in which there would be a greater dilution of the weighted value of the large induction dose by the longer time factor; second, to the decreasing reflex stimulation of the respiratory center from trauma in long major operations, in which increasing numbers of pathways of nerve conduction are severed, thus causing a progressive diminution in the number of afferent impulses conducted centrally from the field of operation to the respiratory center.

The type of operation is important in determining the rate of utilization of the drug because of the varying intensity of the afferent neurogenic impulses initiated by trauma in the different anatomic areas. Reflex stimulation of respiration from trauma in the lumbar and sacral regions during pelvic operations is minimal, as contrasted with the maximal stimulation of respiration by reflexes initiated in the subdiaphragmatic region during surgery of the stomach or gall bladder.

The first comparative study of the rate of utilization of pentothal before and after the interruption of afferent nerve impulses by procaine nerve block was made during two series of operations on the gall bladder and ducts. The first series in which a study of the rate of utilization of pentothal was made were all performed under pentothal action alone, so that all reflex arcs between the periphery and the respiratory center were intact. The increased need for pentothal to control the stimulation of respiration from traction on the gall bladder was apparent to both the surgeon and the anesthetist and borne out by charts and averages. The second series was performed after establishment of anterior splanchnic block anesthesia as a supplement to the already established pentothal anesthesia. The splanchnic block interrupted the afferent visceral sensory impulses initiated by traction on the gall bladder, and reduced the reflex stimulation of respiration in a manner clearly apparent to the surgeon and anesthetist and again borne out by the charts (Chart 1) and figures. The diminution of respiratory stimulation was paralleled by a sharply reduced rate of utili-

Type of Operation	Number of Cases		Rate of Utilization - Gms./Min.	
	Pentothal Alone	Pentothal and Block	Pentothal Alone	Pentothal and Block
Cholecystectomy	22	22	0.033	0.019
Gastric Resection	3	3	0.039	0.011
Right Hemicolectomy	2	2	0.014	0.006
Radical Breast	4	6	0.023	0.013

CHART I.

zation of pentothal as is reflected in the 50 per cent reduction in the rate of utilization of pentothal per minute after splanchnic block. In the first series of operations done under pentothal anesthesia alone, the rate of utilization of pentothal was 0.033 gm. per minute; in the second series in which pentothal anesthesia was supplemented by anterior splanchnic block with procaine, the rate of utilization was nearly halved to the figure of 0.019 gm. per minute. A second comparable study was made by supplementing pentothal anesthesia with procaine intercostal nerve block for radical mastectomy. Again two series were run. In the first group of cases operated on under pentothal anesthesia alone so that all reflex arcs between the respiratory center and the periphery were intact, the rate of utilization of pentothal was 0.023 gm. per minute. In the second series, in which pentothal anesthesia was supplemented by intercostal nerve block which interrupted all afferent impulses so that they did not reach or stimulate the respiratory center, there was a sharp reduction by nearly a half in the rate of utilization of the drug per minute to the figure 0.013 gm. In several instances a cholecystectomy or a radical mastectomy was performed when supplemental procaine nerve block (splanchnic or intercostal) was used, without the need of administering any further pentothal after the initial induction dose.

PNEUMOGRAPHIC OBSERVATIONS

A systematic study of reflex activation of respiration from surgical trauma, which is clearly apparent by observation alone, was made with pneumographic studies of low intercostal (thoracic) respiration. This level provides the best recording of the all important expiratory phenomena of respiratory stimulation. The results of these recordings may be reviewed quickly under the following headings: (A) Pentothal Effect; (B) Traumatic Reflex Stimulation of Respiration; (C) Neurospecific Segmental Reflex Responses (cervical, thoracic, lumbar, sacral).

A. Pentothal Effect. The crux of pentothal effect in third stage anesthesia—assuming an absence of traumatic reflex stimulation of the respiratory center—is a smoothly graded depression of respiration. This effect is measured on a pneumogram as a curve with gradually diminishing amplitude which measures the decreasing volume of respiration. There is practically no alteration in the volume of respiration at a constantly maintained level of pentothal anesthesia as shown by Graph No. 1. The characteristic uniformity of the pattern of respiration is impressive. In this and in all subsequent graphs, inspiration is recorded by the downward stroke of the pen, while expiration is recorded by the upward stroke of the pen.



Graph No. 1.—Induction of anesthesia with pentothal.

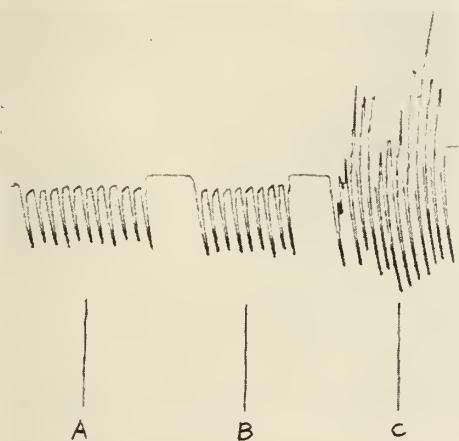
Graph No. 2 shows, after an initial basic run of unstimulated respiration to A, a mild stimulation of respiration from the trauma of an incision made in a reflex area of low intensity. This is manifested by an increase in the amplitude of respiration. The administration of 40 cc. of 1 per cent solution of pentothal in successive fractions of 10 cc. amounts, given with a minute interven-



Graph No. 2.—Pentothal action during surgery.

ing between the fractions (after B), represses the reflexly stimulated respiration as the surgical procedure advances, until the amplitude of respiration is definitely reduced. As the drug is progressively metabolized, respiratory amplitude is gradually restored to fuller volume (after C). The depth of anesthesia, nevertheless, is still adequate to control significant traumatic reflex stimulation of respiration.

B. Traumatic Reflex Stimulation of Respiration. This whole body of research is based on the premise that traumatic or painful impulses are conducted centrally in the anesthetized patient, and that they impinge upon and stimulate the respiratory center: that they do not ascend higher during third stage pentothal anesthesia, because they are blocked by the specific action of pentothal at the level of the thalamus. Graph No. 3 is presented to substantiate this basic premise. The tracing is made with three distinct runs of the pneumograph. The first run (A) was made under pentothal anesthesia prior to any surgical trauma. It exhibits the usual type of curve. The second (B) and third (C) runs were made while making an abdominal incision the upper half of which, only, was carefully procainized by subcutaneous and intracutaneous infiltration with procaine. The contrast between the respiratory response to incising the upper injected and lower uninjected halves of the incision is striking. Under exactly the same conditions of anesthesia and trauma except for the peripheral suppression of painful impulses in the upper half of the incision by procaine infiltration, there is a completely different respiratory response. The second run, recorded while making the incision in the upper procainized half, shows a stable unvarying type of respiratory curve identical to that seen in the first run under anesthesia alone. The third run, recorded while

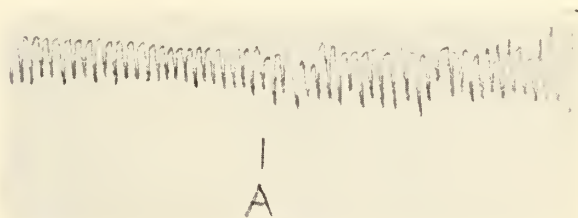


Graph No. 3.—Traumatic reflex stimulation of respiration.

making the incision in the lower uninjected half, exhibits the characteristic reflex stimulation of respiration particularly on the expiratory side, which typifies the response to surgical trauma in this part of the body.

C. Neurospecific Segmental Response (Cervical, Thoracic, Lumbar, Sacral). Characteristic and differing patterns of respiratory response are demonstrable following trauma in each of the four major neurologic regions of peripheral nerve distribution. By and large the same pattern of response is noted in a particular neurologic segment whether the site of trauma for the particular neurologic region is in the somatic zone (cerebrospinal nerve conduction) or in the visceral zone (visceral sensory autonomic nerve conduction).

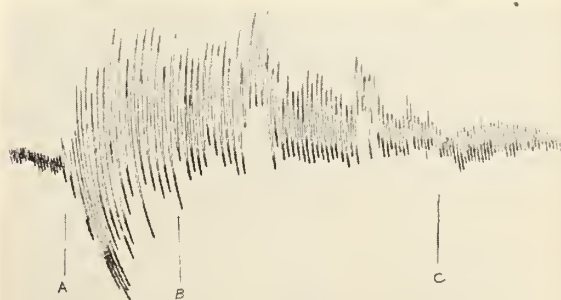
1. Cervical Segment. For the most part there is little evidence of reflex stimulation of respiration by trauma in either the somatic or visceral regions of cervical nerve distribution. Graph No. 4 shows first a normal run without trauma, and in the sec-



Graph No. 4.—Cervical somatic.

ond part (A) the minimal respiratory stimulation associated with making a skin incision in the neck for thyroidectomy. Trauma in the visceral zone shows a complete absence of significant stimulation of respiration during the clamping and resection of the thyroid gland.

2. Thoracic Segment. From the thoracic segment (intercostal nerves) which covers the area from the base of the neck to the symphysis pubis come the most arresting manifestation of reflex stimulation of respiration by surgical trauma. This is of great importance because the manifestations of reflex stimulation is predominantly on the expiratory side of respiration as a consequence of reflex activation of the abdominal accessory muscles of respiration (transversus abdominis, and the external and internal oblique muscles). Activation of these muscles disturbs abdominal quietude so essential to a satisfactory surgical field. The most vigorous expiratory efforts are manifest from stimuli arising from the somatic portions of the thoracic area as shown in

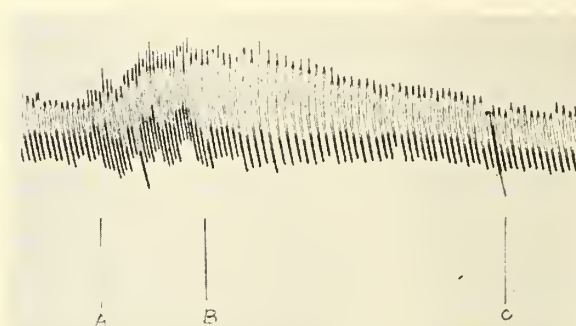


Graph No. 5.—Thoracic somatic.

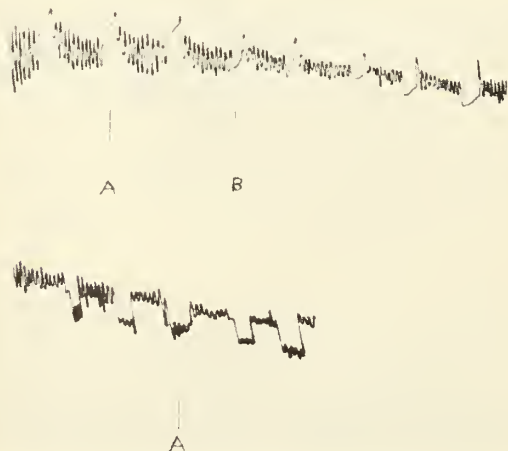
Graph No. 5. After an initial run with moderate amplitude before any surgical trauma is instituted, there appear sudden explosive respiratory cycles immediately upon starting an incision (A). Although there are a few initial inspiratory downstrokes of considerable magnitude, these are quickly followed by a succession of expiratory upstrokes of excessive amplitude (B). These result from a marked prolongation and intensification of expiration due to forceful reflex contraction of the accessory abdominal muscles of respiration which pull on the lower rim of the thoracic cage. This shift distorts the normal inspiratory-expiratory ratio of 1 to 1, over to the abnormal ratio of 1 to 5 or 10. This reflex activation of respiration is quickly controlled upon fractional administration of additional amounts of pentothal as shown in the latter half of the graph. The additional pentothal restores expiration to its normal passive character (C), and the lateral abdominal muscles are inactivated (not paralyzed). The amplitude of the expiratory phase of respiration is restored to normal proportions, and the inspiratory-expiratory ratio returns to its usual 1 to 1 relationship. This state of pentothal control when combined with a procaine block paralysis of the rectus abdominis muscles, provides an ideal state of abdominal quietude for surgical purposes.

The respiratory response to trauma in the visceral portions of the thoracic region is of a more complex character. This probably is related to a mixed innervation for the visceral regions derived from the sympathetic and vagal sources, and possibly somewhat in the upper abdomen from the phrenic sources. In a sufficiently light plane of pentothal anesthesia the predominance of the expiratory response to trauma is still demonstrable. Prolonged expiratory arrest both for the intercostal and diaphragmatic components of respiration from traction on the pyloric end of the

during a cholecystectomy. The next Graph, No. 6, is a recording which follows immediately on the establishment of an anterior splanchnic nerve block with procaine. After three episodes of expiratory arrest from traction on the gallbladder (A), infiltration of the procaine causes these to disappear and the phenomenon is altered. The traction respiratory phenomenon is converted into a phase of inspiratory arrest of respiration (B). In the next line, taken after the passage of more time, there is still a downward curve indicating transfer of the thoracic cage to the position of inspiration, but there is no longer complete arrest of intercostal respiration. Increasingly the curves of intercostal respiration although of lessened amplitude, become superimposed on the inspiratory phenomenon of traction (A). As a consequence the upward forceful retraction of the liver and gallbladder by the diaphragm into the deep recesses of the abdomen during expiration, which is the principal handicap of pentothal anesthesia during upper abdominal surgery, is nullified. The liver and gallbladder swing easily downward and out into the incision, providing an ideal field for surgical procedures on the biliary passages. To accomplish this effect with pentothal alone would entail entering undesirably deep planes of pentothal anesthesia.



Graph No. 7.—Lumbar visceral. Procaine block.



Graph No. 6.—Thoracic visceral. Splanchnic block. Expiratory and inspiratory arrest.

stomach has been recorded. The same phenomenon of expiratory arrest under pentothal anesthesia was also induced by traction on the gallbladder

3. *Lumbar Segment.* Reflex stimulation of respiration from the lumbar somatic zone is of minimal intensity, and of little surgical significance. There is usually a gentle stimulation of the amplitude of respiration. Importantly there is no activation of the accessory abdominal muscles of expiration, so that there is no disturbance of abdominal quietude during operation. This gentle stimulation is frequently entirely absent, and is easily controlled by small additional fractions of pentothal. The effect of lumbar visceral stimulation is shown dramatically in Graph No. 7. After an initial control run without trauma following surgical exposure of the presacral (superior hypogastric) plexus of nerves, the plexus was traumatized (A to B) and subjected to traction with a thumb forceps. There is an immediate increase in the rate and amplitude of respiration. Then procaine solution was injected above the point of continuing trauma to the plexus (B). The immediate effect of the block was that the rate of respiration was quickly re-

duced. Subsequently the amplitude decreased more gradually, but just as definitely. Following complete surgical severance of all the presacral fibres at the dark line (C), as the initial step in a presacral neurectomy, a marked yet stabilized reduction both in the rate and amplitude of respiration occurred.

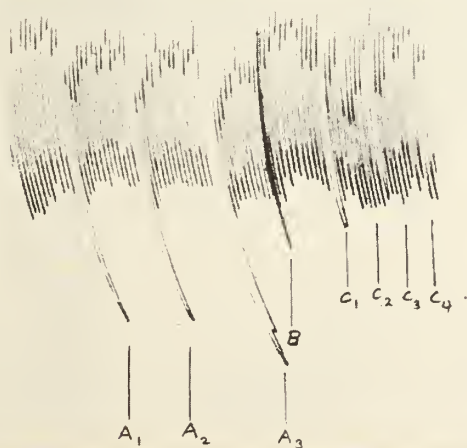
4. Sacral Segment. The area of sacral nerve distribution provides an interesting type of reflex stimulation of respiration by trauma. Again in the sacral area the respiratory response is identical in the somatic (cerebrospinal) and visceral (autonomic) zones. The response to trauma in this area consists of a single prolonged inspiratory effort associated with a distinct moaning phonation from reflex laryngospasm. In the visceral zone with autonomic sacral nerve distribution, the reflex was elicited by traction on the uterus which produces tension in the cervico-vaginal region at the point of juncture with the utero-sacral ligaments. The significance of the utero-sacral ligaments as the source of this reflex was demonstrated by cutting the entire cuff of the vagina away from the cervix except at the point of attachment of the utero-sacral ligaments. With this restricted area alone intact, the reflex persisted in full force with repetition of traction. Injection of the utero-sacral ligaments with procaine promptly obliterated the reflex. Subsequently in several instances where the reflex was encountered prior to beginning a hysterectomy, it was obliterated by injecting the utero-sacral ligaments with procaine solution. The utero-sacral ligaments have consequently been identified as a pathway carrying afferent fibers from the sacral plexus of autonomic nerves (inferior hypogastric plexus) which transmit impulses centrally as a result of surgical trauma so as to stimulate inspiration and induce a reflex laryngeal phonation. The relationship of this reflex to the sacral plexus is demonstrated in Graph No. 8. Here three sharply prolonged inspiratory efforts were induced by separate tractions on the utero-sacral ligaments. (A₁, A₂, A₃). Each in-



Graph. No. 9.—Sacral visceral. Ether anesthesia.

spiration was associated with a moaning laryngospasm. At the dark line on the graph (B), while the recording was interrupted, a deep presacral injection of procaine in the region of the inferior hypogastric plexus was made. Following the injection traction was again exerted several times (C₁, C₂, C₃, C₄). In only the first instance of traction was a feeble disappearing inspiratory response demonstrated. Following this single feeble response there was a complete obliteration of all further reflex stimulation of respiration by traction.

A growing familiarity with these reflex patterns led the author to watch for evidences of them while working under anesthesia with other agents. Ample evidence could be noted that the same pattern of reflexes prevailed, although partially obscured, with the other agents. Under spinal anesthesia even as high as the third interspace, the visceral traction reflex from the gallbladder occasionally produced unendurable pain and respiratory distortion—even expiratory, arrest, due undoubtedly to the entrance of impulses over the splanchnic sympathetic fibers into the cord at the second or first thoracic levels, which is known anatomically to occur. Infiltration of the mesentery around the cystic and common duct region eliminated this painful reflex. Under ether anesthesia during the second stage, the prolonged vigorous expiratory effort from reflex activation of the abdominal accessory muscles of respiration was frequently observed. Finally a clinching bit of evidence that these reflexes underlie the whole field of surgical anesthesia with all anesthetic agents is presented in Graph No. 9. This graph, made during a hysterectomy at a point under deep, third stage ether anesthesia, shows three typical prolonged inspiratory efforts associated with reflex moaning laryngeal phonation (A₁, A₂, A₃) from traction on the uterus and on the utero-sacral ligaments. The validity of this whole study as an exposition of the basic reflex patterns in back of the physiology of surgical anesthesia appears therefore to be substantiated.



Graph. No. 8.—Sacral visceral. Pentothal anesthesia. Procaine block.

Treatment of Acute Throat Infections, With Special Reference to the Use of Penicillin*

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PRIOR to chemotherapeutic and antibiotic substances, the treatment of throat infections consisted of rest, local drug applications, forcing of fluids and alkalization. Early in 1945, the treatment began to take on a new significance, when penicillin became generally available. Complications such as Ludwig's Angina, peritonsillar abscess and peritonsillar cellulitis were not infrequent and when these appeared, severe illness and occasional fatalities resulted. This paper is presented to show the specific therapeutic role which the sulfa drugs and penicillin play in the treatment of acute throat infections. A military hospital has proved ideal, for observation, isolation, availability and otherwise suitably controlled studies on groups of patients. In the later months of 1945 and early 1946, a total of 561 cases of throat infections were treated. These were divided into certain groups (Figure 1), acute exanthemata (scarlet fever), acute tonsillitis, acute pharyngitis, monilia (rare), Vincent's Angina, peritonsillar cellulitis and abscess, and Ludwig's Angina.

During this period of observation, 2,212,800,000

units of penicillin were administered to all types of cases. This amount gave a first hand opportunity to explore the efficiency of the drug in a large variety of conditions and to note the effect of all dosage scales and routes of administration, as well as blood and body fluid levels, response to therapy, relapses, and the development of penicillin resistance.

THE USE OF PENICILLIN

No rule can be applied to all cases in the use of penicillin, as the success of treatment depends on the sensitivity of the primary invading organism, the presence of secondary invaders and the resistance of the patient.¹⁵ The bacteriological study of the infecting organism prior to the institution of treatment is ideal. When dealing with acute fulminating infections, acute infections and contagious diseases with high morbidity rates, of complications, treatment should be instituted without waiting to obtain the results of preliminary bacteriological studies. Sensitivity tests in our experience did not seem warranted unless the case was resistant to the instituted therapy. An evaluation of the sensitivity of the invader was indicated, before stopping or prolonging, or increasing the amount of the drug.

PERITONSILLAR ABSCESS

Peritonsillar abscess has long been considered a surgical disease. Treatment consisted almost entirely of lancing and draining. This method usually gave good end results. It had a morbidity of prolonged illness, pain and discomfort, frequent delayed resolution, a high relapse rate and it was not without hazard. Although in many instances surgical treatment was a life saving measure, since the advent of penicillin the treatment of peritonsillar abscess is no longer surgical. Medical management with antibiotic therapy is now the treatment of choice. This consists of large doses of penicillin administered intramuscularly.⁹ The local infiltration of penicillin around the abscess was tried and results were equivocal.⁸

Thirty-eight cases of peritonsillar abscess were treated with penicillin intramuscularly. Two of these cases were treated after delayed recovery following surgical drainage. In the non-surgical group there was a complete resolution of the abscess. The actual abscess became sterile and asymptomatic in 72 hours but the tissues did not return to normal for a period of ten to fourteen days. (Figures 2 and 3.) A maintenance dose of penicillin was given during this convalescent asymptomatic period. Penicillin during this convalescent period was necessary to prevent relapse.

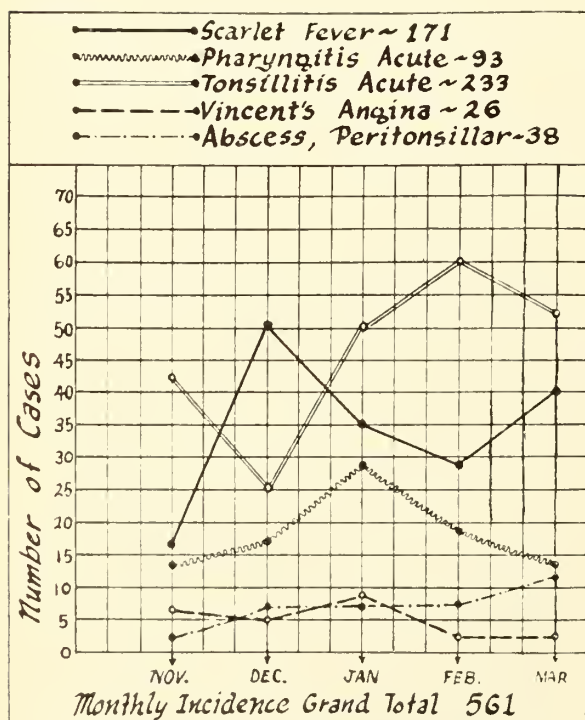


Fig. 1.—Incidence and distribution chart of the series of throat infections studied.

* Read before a combined meeting of the San Diego County Medical Society and the staff of the U. S. Naval Hospital, San Diego, April 9, 1946.

After recovery was complete, throat and tonsils returned to a normal appearance. Tonsillectomies were not advised at this time. A period of one to three months was allowed to elapse before elective surgery was recommended.

THE CONCURRENT ADMINISTRATION OF SULFONAMIDES AND PENICILLIN

The concurrent administration of sulfonamides and penicillin in adequately large doses,¹⁶ is advocated for the desperately ill patient. The blending of two or more chemotherapeutic agents or antibiotics, as with anesthetic agents, known as "balanced therapy" produced an efficient result. This balance is brought about when penicillin and

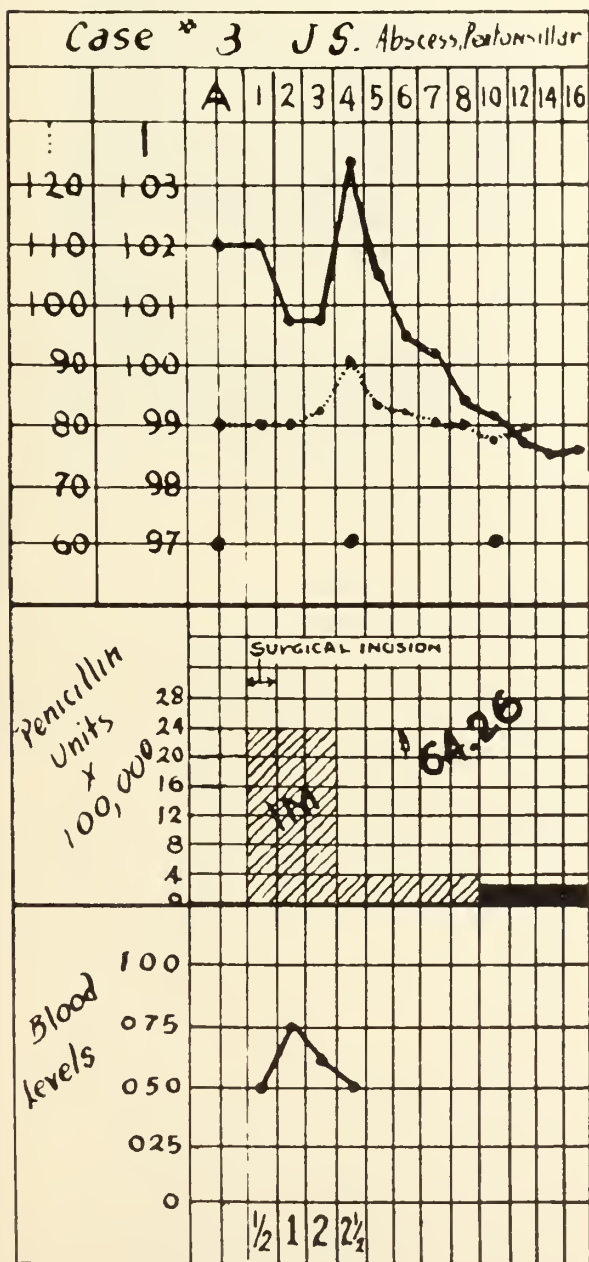


Fig. 2.—Peritonsillar abscess: Surgical incision made on first hospital day. Intramuscular penicillin is represented by diagonal lines—Oral penicillin by solid black.

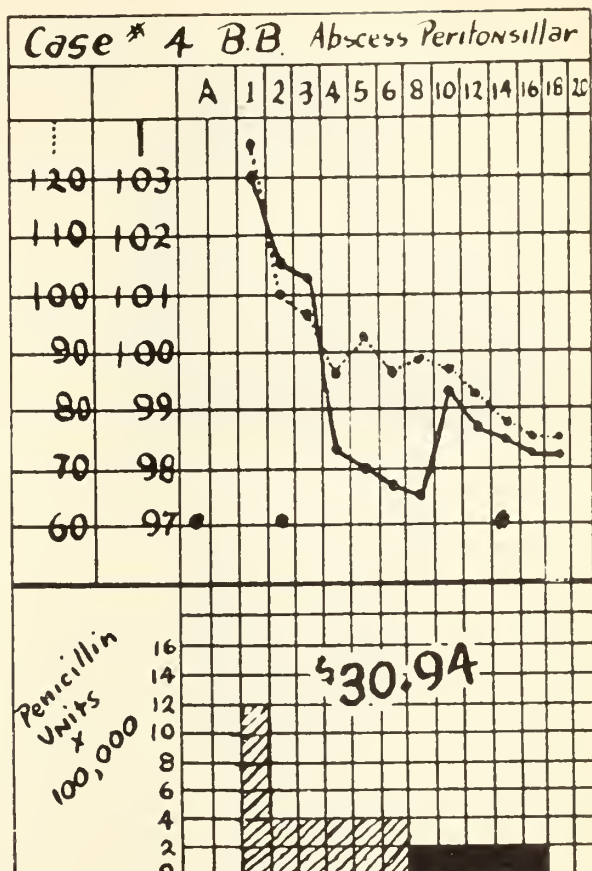


Fig. 3.—Peritonsillar abscess: No surgery. Note prompt response to penicillin therapy, both intramuscularly and orally and compare with Fig. 2.

sulfonamides are combined. In addition to a specific effect on a common organism, each has an individual specificity. This broadens the scope of action in preventing complications and terminating infection. Other agents or measures may be combined to produce balanced therapy, such as hyperthermia and local applications to remove inhibitory substances¹⁵ such as penicillinase. This principle of balanced therapy has been used when the patient's life was at stake, or unusual resistance was manifested.

Ludwig's Angina (Figures 4 and 5), acute severe peritonsillar cellulitis with early abscess, lobar pneumonia, meningococcal meningitis, pneumococcal meningitis and certain other overwhelming infections of coccal and spirochetal origin are examples of serious infections requiring such balanced therapy. Excellent results have been obtained in a large number of cases from the concurrent administration of large doses of penicillin (probably G fraction) by the intramuscular route (100,000 units every hour) or occasionally by the intravenous route, and by intravenous sulfonamide diluted in one-sixth molar sodium lactate-Ringer's solution. Subsequently the sulfonamide was given orally with 3 grams of sodium bicarbonate for each gram of sulfonamide.

It has been reported^{15, 28} that in certain mixed infections, when some organisms are resistant to treatment, the "modus operandi" of antibiotic

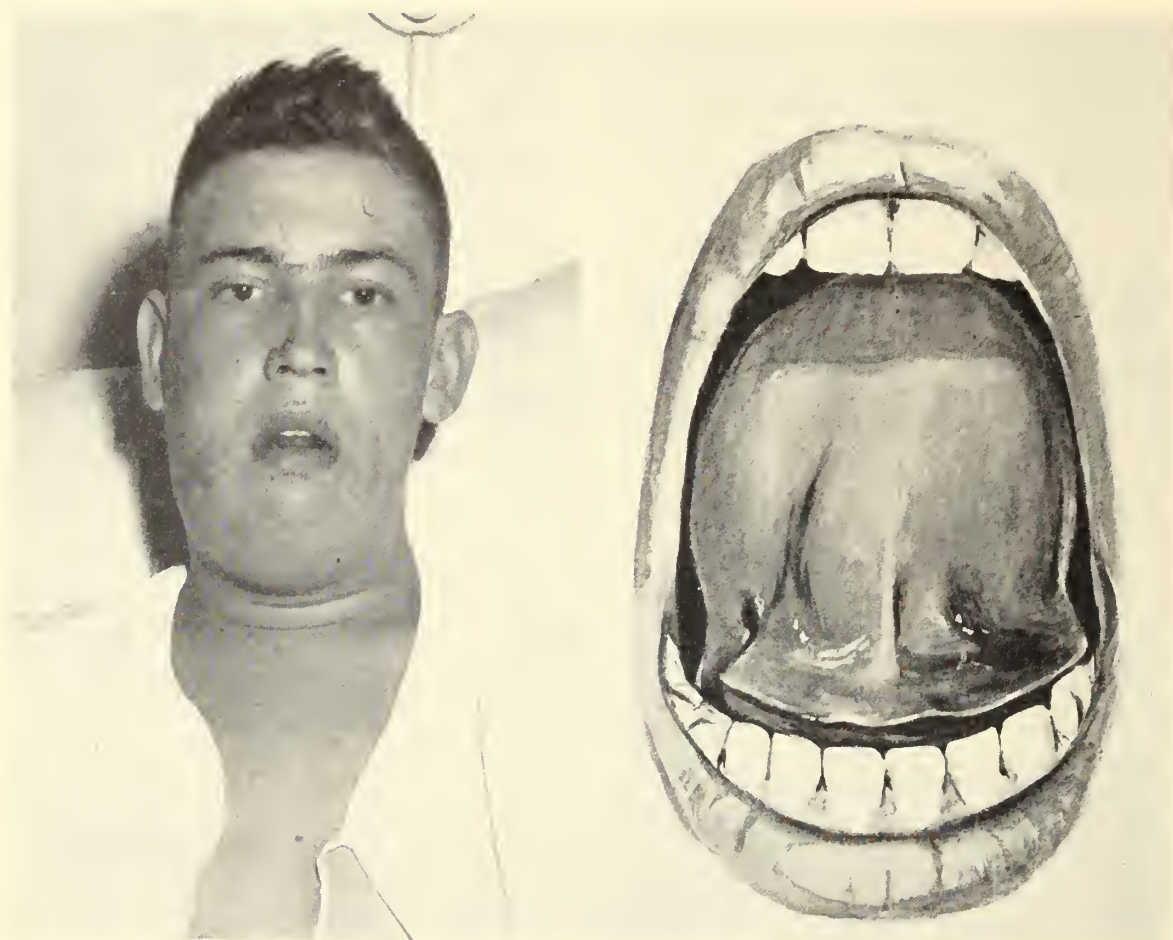


Fig. 4.—Case R.A.P. Severe case of Ludwig's angina. (A) Photo showing swelling of neck structures still present forty-eight hours after beginning treatment. (B) Drawing of cauliflower mass beneath tongue which was found to be a diagnostic feature in all cases of Ludwig's angina.

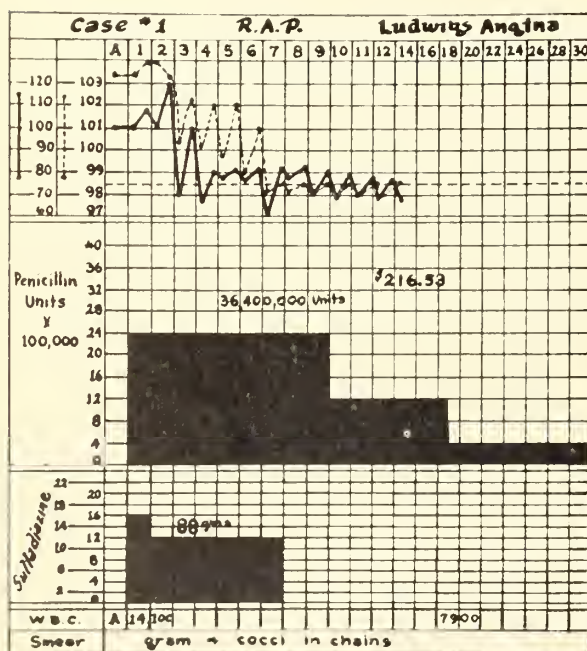


Fig. 5.—Clinical summary of case R.A.P. showing course of illness with "balanced therapy" in massive doses.

therapy is to suppress the sensitive group while the natural immunity of the host removes the others. Perhaps this explains the necessity for prolonged treatment in many cases of throat infection and the tendency for them to relapse when the course of treatment is too short.

The authors have noted cases which have developed the so-called hepato-renal syndrome following the administration of as little as one gram of a sulfonamide to a dehydrated patient with a severe throat infection. Three cases of dermatitis, two of which were exfoliative in type, have been treated because of sulfonamide sensitivity. The first dose of the sulfonamide, when given to a case of severe fulminating throat infection should be administered diluted in a suitable alkaline intravenous infusion.

As a result of mass sulfonamide prophylaxis undertaken by the military services against respiratory infections and rheumatic fever it was found that the incidence and morbidity of these diseases was not materially decreased. However, a small percentage of these prophylactically treated individuals became sensitive to sulfonamide drugs.

It had become a common practice before the advent of penicillin to use the sulfonamides as

a specific and even a prophylactic in any and all types of throat infections. We do not advocate this. The purpose of this paper is to call attention to a safer and better method of treating this type of case. It is illogical to risk sensitizing an individual for the treatment of a tonsillitis or pharyngitis which could be treated more efficiently with penicillin rather than with a sulfonamide. Penicillin treated cases do not need frequent blood counts and microscopic urinalysis, which are necessary for management of cases receiving sulfonamides. The use of penicillin in the treatment of throat infection is indicated^{18,24} because alpha and beta hemolytic streptococci, which are often sulfa-resistant, are the most frequent cause of throat infections.⁶ In this series of 561 cases all alpha and beta types were favorably affected by penicillin. This was evidenced by fewer hospital days, lessening of discomfort, and shortening of the contagious phase of the illness.

ORAL ADMINISTRATION OF PENICILLIN

The oral administration of penicillin has been proved adequate by producing satisfactory therapeutic blood levels and excellent clinical results. Collen⁷ reports 12 cases of pneumococcic pneumonia which were treated with oral penicillin administered in dosage of 200,000 units initially followed by 100,000 units every two or three hours. Two grams of calcium carbonate were given with the penicillin. Therapeutic blood levels were established and maintained on this regime and results were wholly satisfactory. Libby¹³ used a gelatin capsule containing 150 to 300 units per mg. of sodium and calcium salts of penicillin suspended in cottonseed oil. This gave therapeutic blood levels of .03 to .06 units per cc. Burke and his associates⁵ state that the penicillin must be protected from the destructive power of hydrochloric acid of the stomach and yet must be released and subsequently absorbed before it reaches the inhibitory influence of the *Escherichia coli* bacilli. He advocates administering two aluminum hydroxide tablets 30 minutes before one gelatin capsule (treated with 1-20 formaldehyde for five seconds and 70 per cent alcohol for five minutes), containing 100 units of penicillin. He obtained a rapid initial rise within the first half hour, with a therapeutic level still present four to five hours later. It was concluded that when the oral dose was two times or more greater than the parenteral dose, blood levels exceeded the parenteral medication blood levels. Welsh²⁷ reports that penicillin blood levels may be prolonged by using aluminum hydroxide as a vehicle.

Keith and others^{2, 10, 12, 14, 20} report the successful treatment of throat infections by penicillin orally. Various methods produced and maintained effective blood levels such as penicillin mixed with egg, or other foods, taken concurrently with aluminum hydroxide or taken alone dissolved in tap water. It was generally concluded that the drug should be protected from inactivation by gastric acidity. One hundred thousand units every three hours provided therapeutic blood levels within or above the effective anti-bacterial range of most sus-

ceptible organisms. Woodward and Holt²⁸ report the treatment of pharyngitis and nasopharyngitis by the topical application of penicillin. These topical applications consisted of sprays of 500 units per cc. of isotonic salt solution combined with lozenges (800 units per lozenge), lozenges alone, or spray alone. It was concluded that the action of penicillin was more bacteriostatic than bactericidal, that the topical application was beneficial and that lozenges were the best vehicle. In our own experience it was concluded that ice cream constitutes the best vehicle.

CLINICAL EXPERIENCE WITH THE ORAL ADMINISTRATION OF PENICILLIN IN ICE CREAM

The use of ice cream as a vehicle for penicillin administration is not original with the authors of this paper. We believe that ice cream was first used as a vehicle by Comdr. R. N. Nolan (MC), U.S.N. (Ret.) at the United States Naval Training Center, San Diego, California. In this paper we have attempted to apply Comdr. Nolan's formula, with slight variation, to the treatment of various types of acute infectious diseases and throat infections. We have, furthermore, attempted to determine growth inhibition blood levels obtained on test organisms. Our study is by no means complete; nevertheless, we have discovered a useful therapeutic weapon and are accumulating evidence that virulent infections can be removed from or inhibited in the oropharynx.

Ice cream as a vehicle serves several purposes. It is easy to mix. It partially disguises the peculiar taste of penicillin and the mixture is palatable. The mixture is a demulcent and is held in a tenacious film in the oral pharynx for a considerable period of time. Ice cream acts as an anacid. Because of its low temperature the penicillin remains stable.

The vehicle is readily obtainable, the recipe* is easy to compound and the total cost is further reduced. Chocolate flavored ice cream covered the bitter taste of the penicillin most effectively.

In the series of cases reported, the penicillin ice cream was prepared fresh daily. The stock of penicillin used in the mixture was kept in the pharmacy at ice box temperature. The mixture was made in the morning and placed in an ice cube tray in an ordinary icebox and became frozen in approximately six hours. Each cube represented one dose and an ample supply was maintained at all times. The mixture, if kept frozen, can be kept as long as any ice cream preparation.

Cases treated with penicillin ice cream were instructed to hold the preparation in the oral

* The recipe is as follows: by an electric malt mixer mix one quart of ice cream with one million units of penicillin crystals, previously dissolved in 50 cc. of cold tap water. Thoroughly mix and pour into an ordinary ice cube tray and allow to freeze until solid. By means of a ruler divide the tray into 40 equal cubes. Each cube then of approximately 25 cc. contains 25,000 units of penicillin. Special trays may be adapted for individual ice boxes. Such adaptations are ideal for home use. An example of this with special cutter is illustrated (Figure 6).

pharynx as long as possible and to refrain from taking anything by mouth for at least two hours. This served to keep the penicillin at local lesions as long as possible and also prevented high fluid intake which would further reduce the penicillin blood levels. Dehydration in the toxic cases was not extreme; some required fluids which were given during the hour preceding the medication or intravenously. The dosage was one cube (25,000 units) of the mixture every three hours night and day. The hours of administration were arranged so that they did not conflict with meal time.⁴

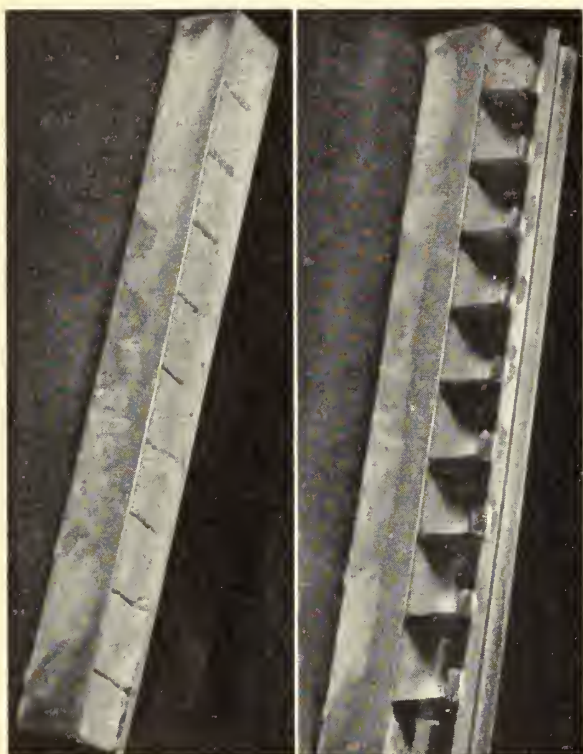


Fig. 6.—Illustration of dispensing tray and view with cutter in place. It is ten cubes long and is ideal for the daily needs of a single case.

The clinical response to this therapy was excellent. Within 12 hours, deglutition was appreciably easier, and after 24 hours fluids and soft diets could be tolerated comfortably. A corresponding decrease was noted in lymphoid tissue edema and mucosal inflammation. Exudative follicles on the tonsils showed regression but not complete resolution. The temperature receded one or two degrees or returned to normal. After 48 hours the patients rarely had difficulty in deglutition and were usually asymptomatic. The mucosa rapidly returned to normal color and the exudative follicles of the tonsils or pharynx disappeared. Some pus might be expressed from the deep crypts of the tonsils at this period (48 hours). Those patients demonstrating cervical adenopathy seldom complained of pain or tenderness on palpation of the nodes. After 72 hours the patients were asymptomatic.

The clinical response has been consistent in the treatment of certain types of cases; pharyngitis, tonsillitis and scarlet fever. The treatment

was specific against the spirochetes of Vincent's Angina.^{11, 17, 19, 25, 26} All of the Vincent's cases treated were of the severe, necrotic, ulcerative type. Results were dramatic and conformed favorably with the results in other spirochetal diseases. Smears rapidly became negative and progressive healing began immediately after treatment was started.

One case illustrates that resistance is often only relative to the size of the dose of penicillin. This is particularly demonstrated by one case in our series. A patient with scarlet fever showed marked improvement after 48 hours on oral penicillin, when suddenly his throat became acutely inflamed and large shallow ulcers appeared on both tonsils, covered with a dirty exudative membrane. Concurrent with this development his rash became more intense. To demonstrate that his resistance was only relative he became normal within 48 hours after vigorous treatment with 100,000 units of penicillin hourly for 48 doses administered intramuscularly.

By this mode of administration (penicillin ice cream) one may expect a local effect on the pathogenic bacteria harbored in the oral and pharyngeal mucosa. In addition there is the systemic effect from that absorbed into the blood stream. It is likely that future experimental studies may reveal an equal efficiency and economy compared to intramuscular penicillin, if the dose, interval of administration, and vehicles for various types of cases are once determined.

Because the potency of penicillin is maintained longer under low temperatures, a frozen vehicle, such as ice cream, lends itself well to hospital service. Penicillin ice cream is easily stored in an ice box and can be administered without further preparation.

TREATMENT OF SCARLET FEVER BY PENICILLIN IN ICE CREAM

(Observation of 150 Cases)

Previously the routine treatment of scarlet fever consisted of scarlet fever streptococcic antitoxin in a dose of 18,000 U.S.P.H. units for adults. This was given intramuscularly in two doses, on admission, after careful evaluation of any allergic diathesis.

In most principles our observations concur with those presented by Ashley.¹ With the availability of penicillin, cases were given either antitoxin, oral penicillin or both. Complications were few and recovery was more rapid in those receiving both agents. Desquamation began within 18 to 36 hours. The erythema faded in 36 hours. The residual red throat and soreness persisting after antitoxin disappeared under the influence of oral penicillin. The average case was clinically well in 48 hours or less. Many cases did not desquamate when given this combined treatment. Sulfonamides have been abandoned by us in the treatment of scarlet fever because the streptococci causing scarlet fever were found to be resistant to them.

A recent survey²¹ (254 throat cultures showed a beta hemolytic streptococcus carrier rate of 22.5

per cent). These studies were made on a representative group of the personnel at a large military training center in Southern California.

Two hundred and nine cases of scarlet fever were treated with 1,000,000 units of penicillin, given orally, in a period of seven days and uniformly responded with negative throat cultures for beta hemolytic streptococci. Only 158 cases, or 75 per cent, remained culture negative at the end of one week.²² This figure is inconclusively elevated above the carrier rate of 22.5 per cent at the same activity. An additional 15 per cent of part of the series became positive during the second week after treatment ceased. The preventive value of this method of treatment, epidemiologically, can be readily seen.

Breese³ reports that a moderate dose of penicillin for a period of eight days reduced complications of scarlet fever to 8 per cent. Our own therapeutic program reduced complications below their figure.

We observed one fatal case of homologous serum jaundice presumably from human scarlet fever convalescent serum. About 2 per cent of the series of scarlet fever cases were complicated by rheumatic fever. A few developed otitis media.

In conclusion, for the treatment of scarlet fever we advocate the use of scarlet fever streptococcus antitoxin, 18,000 U.S.P.H. units (or 50 cc. of human convalescent serum, if available) and oral penicillin ice cream, 25,000 units every three hours for five to seven days.

PENICILLIN BLOOD LEVELS

We have made a total of 184 penicillin blood level determinations. Of this total, 138 were done

on patients receiving penicillin ice cream (25,000 units) every three hours; and 46 on patients receiving penicillin intramuscularly, average dose of 45,000 units every three hours. The highest initial levels were obtained by the parenteral administration with the average reading showing 0.165 units per cc. This is compared with an average penicillin blood level of orally administered penicillin of 0.053 units per cc. (Figure 7.) However, when administered parenterally, there was marked decrease in the blood level of penicillin to an average of 0.093 units at two hours, while following oral medications there was an initial rise up to 0.070 units per cc. at one and one-half hours followed by a level of 0.053 at a two-hour period. It is conjectured that had the oral dose been as high (45,000 units) there would perhaps have been a corresponding increase in the penicillin blood level.

SUMMARY

1. The therapeutic measures used in the treatment of 561 cases of acute infections of the throat have been discussed.

2. Penicillin ice cream, 25,000 units every three hours has been offered as a therapeutic measure for the treatment of acute tonsillitis, pharyngitis, scarlet fever throats and Vincent's infections of the throat and mouth. This method of administration may be used for other infections caused by organisms susceptible to penicillin.

3. Streptococcus antitoxin serum 18,000 U.S.P.H. units followed by penicillin ice cream, 25,000 units every three hours for five to seven days has been recommended as the treatment of choice for scarlet fever.

4. Massive parenteral doses of penicillin without surgical interference is preferred for proper management of peri-tonsillar abscess unless spontaneous drainage is imminent.

5. The absolute need for prolonged therapy to prevent the tendency to relapse is discussed for cases of peri-tonsillar abscess and other conditions.

6. Balanced chemotherapy with penicillin parenterally and sulfonamides intravenously (later orally) is recommended for certain overwhelming and fulminating infectious diseases, including those of the throat.

7. Penicillin blood levels obtained by the inhibition of test organisms using the serial dilution method have been presented. Therapeutic blood levels were obtained and sustained for over two hours with penicillin ice cream. The levels were not as high as those with parenteral administration but were therapeutically satisfactory in the cases studied by us.

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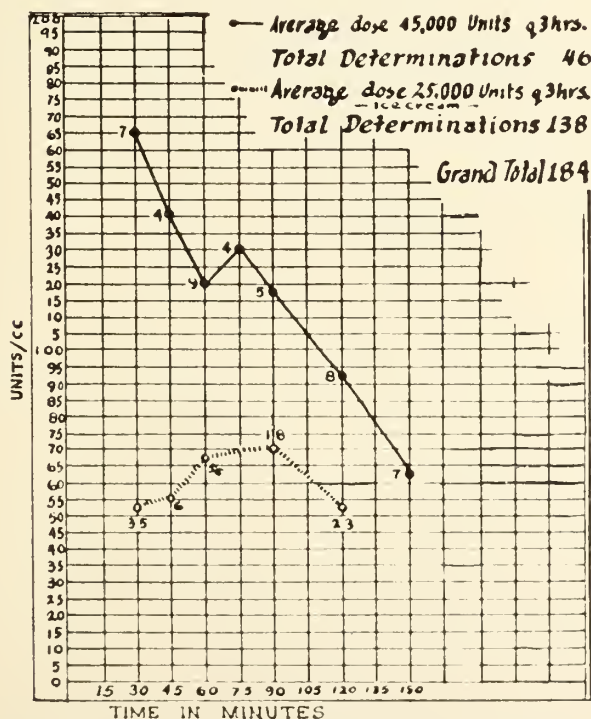


Fig. 7.—Graph showing results of blood level determinations of penicillin. Solid line indicates intramuscular administration, broken line, oral administration.

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STUDIES SHOW NEW DRUG SUPPRESSES MILD FORM OF MALARIA

A new antimalarial drug, pentaquine (SN 13276—a complex chemical with the appearance of yellow needles), has been found effective in suppressing infections due to the commonest and mildest form of the disease known as *Plasmodium vivax*, according to the October 12 issue of *The Journal of the American Medical Association*.

R. F. Loch, M.D., New York, chairman of the Board for Coordination of Malarial Studies, in cooperation with other members of the board, investigated the action of the drug in civilian establishments under the sponsorship of the Committee on Medical Research of the Office of Scientific Research and Development and in various Army installations.

Some of the pertinent conclusions drawn from these studies are:

Pentaquine, studied in mice, rats, dogs, monkeys and human beings, is rapidly and completely absorbed from the gastrointestinal tract.

It has an undesirable, but, at present, ill defined effect

on the heart and circulation when administered in large doses.

The poisonous quality of pentaquine is too great to warrant its use in preventive treatment or prolonged suppression of malaria.

The action of this drug was studied on 171 white volunteers. The investigators concluded that a daily dose of 60 milligrams of pentaquine and two grams of quinine administered concurrently in divided doses every four hours for 14 days is "sufficient to produce radical cure of severe infections due to *Plasmodium vivax*." However, they caution that the daily dose of 60 milligrams should not be exceeded. "Pentaquine should be administered only under close medical supervision, preferably during hospitalization," they add.

In conclusion the article states that the poisonous effect of the drug in Negroes and persons of mixed racial extraction and the safe treatment dosage for children are at present undetermined.

Trends in The Age Distribution of Childhood Diseases*

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THE acute communicable infections commonly referred to as the childhood diseases may be readily divided into groups: (1) Those which every individual must expect to have at some time during his life—pertussis, measles, chickenpox, German measles, mumps; (2) those which he may acquire but for which specific artificial immunity is available—diphtheria and smallpox; and (3) those which he may acquire but for which there is no specific protection—poliomyelitis. Scarlet fever should also be placed in this last group if you agree that immunization for this disease is not specific.

Upon first exposure, most individuals are highly susceptible to all diseases of the first group and to those of the second unless previously immunized. Infection is acquired with the first suitable exposure, normally occurs early in life and, in most cases, results in a lasting immunity. The designation of "childhood diseases" naturally follows. That these infections are not necessarily childhood diseases is substantiated by the occasional case in adult members of the population and the epidemics that have occurred in the armed forces. Such persons have not had suitable exposure during childhood or have lost their specific protection.

The control of the acute communicable diseases specifies certain efforts to prevent the spread of these infections. The success of such control measures may be judged by the incidence of the various diseases over a long period of time. Many of them appear as sharply defined epidemics, and the successive peaks of these epidemics closely follow the population trends, especially the changes in the number of children. In general, the diseases of the first group above have not been successfully controlled by public health agencies; the epidemics progress until the supply of available susceptibles has been exhausted. Intensive efforts have been directed toward the protection of children from these infections: during infancy we would delay the attack until childhood, and during the school years we would further postpone infection in order to improve the average daily attendance. Such efforts, if successful, would result in an increased incidence of these childhood diseases in older children and adults even when there is no reduction in the total number of cases. Disregarding, for the moment, the merits of controlling the childhood diseases, the data at hand may be studied to determine the success of present measures. Has there been a

shift in the age distribution of these diseases from the younger to an older age group?

The reported cases of the various childhood diseases in San Joaquin County during the years 1925-1944 have been analyzed for age distribution. While the population group and the number of cases are not large the figures for this county may be considered of value for other reasons. The entire county including rural and urban areas is served by the San Joaquin Local Health District. The District has had a consistent administrative policy during the 20-year period. Since 1925 there has been a 50 per cent increase in field nursing service, a factor which should maintain or improve communicable disease control. Records have been consistently and carefully kept and, no doubt, reporting has improved during this time.

The general data used in this analysis is presented in Table I. Five-year periods have been used to increase the significance of the figures and to avoid the wide fluctuations between epidemic and non-epidemic years. The data show an increase in the total number of cases of measles, mumps, and chickenpox; a downward trend in scarlet fever, diphtheria, and smallpox; a recent reduction in pertussis; and a slight increase in German measles. The 200 cases of poliomyelitis are about equally divided between the four five-year periods. There has been no case of smallpox since 1939. In recapitulation, attention is called to the total number of cases in younger children. Before they reach the age of ten years, children have had 91 per cent of the reported whooping cough, 84 per cent of the chickenpox, 80 per cent of the measles, 62 per cent of the scarlet fever, 55 per cent of the mumps, 50 per cent of the German measles, 50 per cent of the diphtheria, and 49 per cent of the poliomyelitis. Only smallpox has had a high incidence in adults.

Present interest is directed toward the trends in age distribution, and this can be shown only by taking each disease separately. Starting with chickenpox as the most mild infection, but highly contagious, the graph (Chart I) shows a steady increase in the incidence in preschool children throughout the 20-year period with a corresponding decrease in children of school age. Measles (Chart II), pertussis (Chart III), and scarlet fever (Chart IV) also show an increase in preschool children but not so marked or so regular as that for chickenpox. In contrast, mumps (Chart V) and rubella (Chart VI) show an increase in those individuals over ten years of age. Diphtheria (Chart VII) shows a definite shift away from the two younger age groups; the increase in total cases and in children under five during the last five years is cause for concern. Smallpox (Chart VIII) also shows a shift to the older age groups. The figures for poliomyelitis

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are small but, in general, show a shift to the older groups (Chart IX).

The proper evaluation of these findings requires consideration of changes in the total population by age groups. Specific attack rates would be of value for those diseases that show a definite shift. However, the population at various age levels can be only estimated. Children under five years were enumerated by the census as 7,196 in 1930 and 8,729 in 1940. Extensive migration has reduced the value of these figures, and the actual number of births reported in the area may be a better guide for the trends of diseases in this age group. These figures are presented for the various diseases in Table II.

This table indicates that the number of cases of chickenpox in children under one year of age

follows very closely the number of births, especially in the last decade. As judged by the number of births and the census figures there has been an increased incidence of chickenpox in children age one through four. Whooping cough in the last ten years has not kept pace with the increasing birth rate: local pediatricians believe this can be explained by the use of pertussis vaccine. Diphtheria has been eliminated in children under one year of age but continues to appear in those age one through four.

In the absence of better data the cases of measles and mumps have been compared with the school population during this period. These figures are presented in Table III. The marked increase in high school attendance in confirmed by the census figures for the age group 15-19:

TABLE 1.—Percentage Distribution of Reported Communicable Diseases in San Joaquin County by Age

DISEASE	Age Group	1925-1929	1930-1934	1935-1939	1940-1944	Total 20 Years
CHICKENPOX:	No. of Cases	2,869	3,620	4,694	5,278	16,461
	All Ages	100.0	100.0	100.0	100.0	100.0
	0 - 4	20.2	23.4	24.3	28.7	24.8
	5 - 9	62.5	60.6	60.5	56.0	59.4
	10 - 14	12.2	11.9	11.2	11.0	11.5
	15 - 19	1.5	1.6	1.7	1.7	1.6
	20 or over	3.4	2.5	2.3	2.5	2.6
MEASLES:	No. of Cases	3,240	5,736	6,030	7,331	22,337
	All Ages	100.0	100.0	100.0	100.0	100.0
	0 - 4	22.5	22.1	23.0	25.3	23.5
	5 - 9	63.4	59.0	56.5	53.3	57.0
	10 - 14	10.5	15.0	16.2	15.3	14.8
	15 - 19	1.7	2.2	3.3	3.3	2.7
	20 or over	1.8	1.4	0.8	3.2	2.0
WHOOPING COUGH:	No. of Cases	1,999	3,213	3,205	2,986	11,403
	All Ages	100.0	100.0	100.0	100.0	100.0
	0 - 4	40.9	40.5	41.8	47.7	42.8
	5 - 9	51.4	50.9	48.4	45.0	48.8
	10 - 14	6.2	6.3	7.8	5.4	6.6
	15 - 19	0.1	0.7	0.7	0.6	0.6
	20 or over	1.6	1.4	1.2	1.3	1.3
MUMPS:	No. of Cases	2,649	2,647	4,034	5,926	15,256
	All Ages	100.0	100.0	100.0	100.0	100.0
	0 - 4	13.5	10.2	9.3	10.3	10.5
	5 - 9	48.8	49.8	45.2	42.6	45.7
	10 - 14	26.5	27.1	30.0	27.5	27.9
	15 - 19	3.7	6.4	7.3	9.3	7.3
	20 or over	7.4	6.4	8.3	10.4	8.6
GERMAN MEASLES:	No. of Cases	2,318	263	687	2,960	6,228
	All Ages	100.0	100.0	100.0	100.0	100.0
	0 - 4	13.4	19.7	14.7	10.4	12.4
	5 - 9	46.4	49.5	45.4	29.6	38.4
	10 - 14	29.6	23.2	27.1	29.8	29.2
	15 - 19	4.6	2.3	6.3	20.0	12.0
	20 or over	5.9	5.3	6.5	10.5	9.5
SCARLET FEVER:	No. of Cases	1,930	1,134	1,489	1,012	5,565
	All Ages	100.0	100.0	100.0	100.0	100.0
	0 - 4	16.7	17.0	18.2	24.6	18.7
	5 - 9	42.8	47.2	42.0	44.6	43.8
	10 - 14	23.8	19.5	21.7	18.3	21.4
	15 - 19	6.6	6.3	6.6	6.1	6.3
	20 or over	10.6	9.8	11.4	6.3	9.9
DIPHTHERIA:	No. of Cases	382	127	129	186	824
	All Ages	100.0	100.0	100.0	100.0	100.0
	0 - 4	27.6	26.8	9.3	16.7	22.0
	5 - 9	29.1	31.5	27.1	25.8	28.4
	10 - 14	14.6	10.2	16.3	14.5	14.2
	15 - 19	5.4	6.3	11.6	7.0	6.8
	20 or over	23.8	25.2	35.7	36.0	28.6
POLIOMYELITIS:	No. of Cases	42	54	47	57	200
	All Ages	100.0	100.0	100.0	100.0	100.0
	0 - 4	45.0	16.5	27.6	15.8	25.0
	5 - 9	23.8	29.6	14.9	28.1	24.5
	10 - 14	14.3	35.2	17.0	22.8	23.0
	15 - 19	4.8	7.4	14.9	14.0	10.5
	20 or over	11.9	11.1	25.6	19.3	17.0
SMALLPOX:	No. of Cases	125	80	85	0	290
	All Ages	100.0	100.0	100.0		100.0
	0 - 4	13.6	7.5	5.9		9.7
	5 - 9	16.0	23.8	11.8		16.9
	10 - 14	6.4	12.5	3.5		7.2
	15 - 19	10.4	8.8	18.8		12.4
	20 or over	53.5	47.5	60.0		53.8

8,255 in 1930 and 13,072 in 1940. This increase is still less than the increase in the cases of mumps in children of high school age.

From these figures, accepted for what they may be worth in the light of limited knowledge of population composition, it may be said that

certain diseases have not been altered in their attack on children by efforts to protect the child. In other diseases that have changed, a more satisfactory explanation is available: inoculations for diphtheria and smallpox; widely spaced major epidemics of german measles—1928 and 1942;

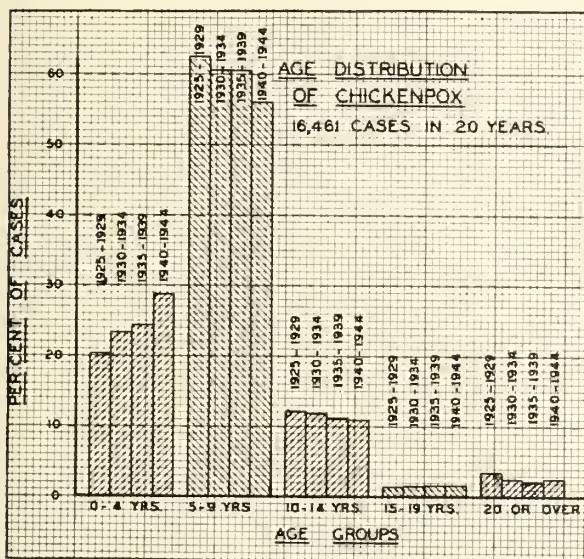


Chart I.

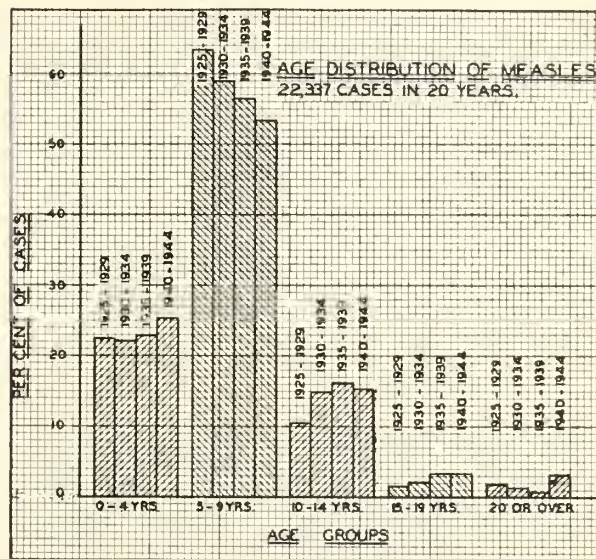


Chart II.

TABLE 2.—Communicable Diseases in Children Under 5

	Age Group	1925-1929 Number	1930-1934 Number	Change	1935-1939 Number	Change	1940-1944 Number	Change	Total 20 Years
Average Annual Births		1,635	1,510	- 8%	1,845	+ 22%	2,695	+ 46%	38,436
CHICKENPOX:	—1	73	92	+26%	144	+ 56%	193	+ 34%	502
	1 & 2	199	296	+49%	388	+ 31%	570	+ 47%	1,453
	3 & 4	309	457	+48%	609	+ 33%	753	+ 24%	2,128
	0 — 4	581	845	+45%	1,141	+ 35%	1,516	+ 33%	4,083
PERTUSSIS:	—1	134	218	+62%	231	+ 6%	256	+ 11%	839
	1 & 2	274	439	+60%	476	+ 8%	538	+ 13%	1,727
	3 & 4	410	644	+57%	634	- 2%	628	- 1%	2,316
	0 — 4	818	1,301	+59%	1,341	+ 3%	1,422	+ 6%	4,882
DIPHTHERIA:	—1	12	2	-83%	0	-100%	0	.....	14
	1 & 2	49	11	-78%	6	-45%	11	+ 83%	77
	3 & 4	43	21	-51%	6	-71%	20	+230%	90
	0 — 4	104	34	-67%	12	- 65%	31	+160%	181
SMALLPOX:	—1	2	1	.....	0	.....	0	.....	3
	1 & 2	5	1	.....	3	.....	0	.....	9
	3 & 4	10	4	.....	2	.....	0	.....	16
	0 — 4	17	6	-65%	5	- 17%	0	-100%	28
MEASLES:	—1	70	91	+30%	96	+ 5%	163	+ 70%	420
	1 & 2	264	467	+77%	443	- 5%	733	+ 65%	1,907
	3 & 4	396	712	+80%	853	+ 20%	961	+ 13%	2,922
	0 — 4	730	1,270	+74%	1,392	+ 10%	1,847	+ 33%	5,239
SCARLET FEVER:	—1	13	3	-77%	18	+500%	6	- 67%	40
	1 & 2	83	65	-22%	74	+ 14%	83	+ 12%	305
	3 & 4	227	125	-45%	179	+ 43%	160	- 11%	691
	0 — 4	323	193	-40%	271	+ 40%	249	- 8%	1,036
MUMPS:	—1	17	5	-71%	12	+140%	17	+ 42%	51
	1 & 2	69	87	+26%	112	+ 29%	188	+ 68%	456
	3 & 4	273	179	-34%	246	+ 37%	406	+ 65%	1,104
	0 — 4	359	271	-24%	370	+ 37%	611	+ 68%	1,611

TABLE 3.—Number of Cases in School Children

	1925-1929 Number	1930-1934 Number	Change	1935-1939 Number	Change	1940-1944 Number	Change
Elementary Schools, A.D.A.....	13,500	14,170	+ 5%	13,620	- 4%	14,830	+ 9%
Measles, Age 5-14.....	2,395	4,256	+78%	4,389	+ 3%	5,023	+14%
High Schools, A.D.A.....	3,535	4,790	+35%	6,710	+40%	6,956	+ 4%
Mumps, Age 15-19.....	98	169	+73%	295	+75%	551	+87%

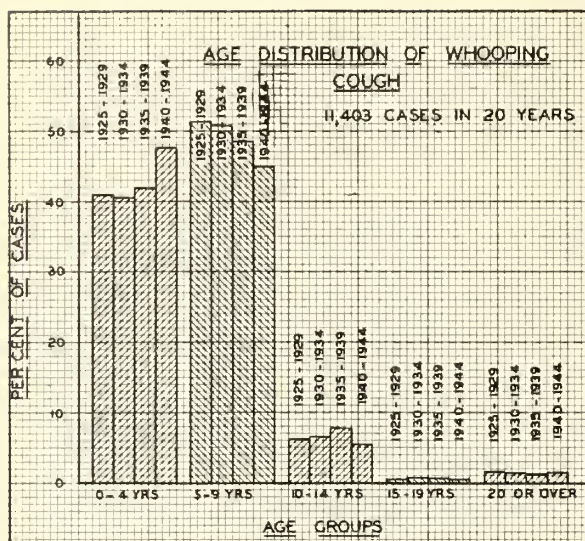


Chart III.

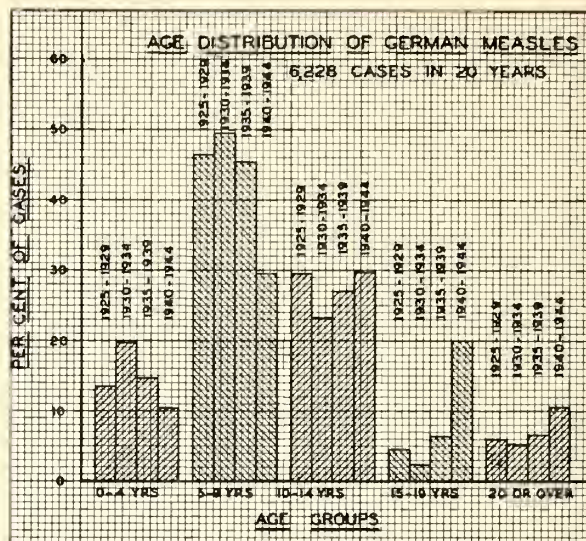


Chart VI.

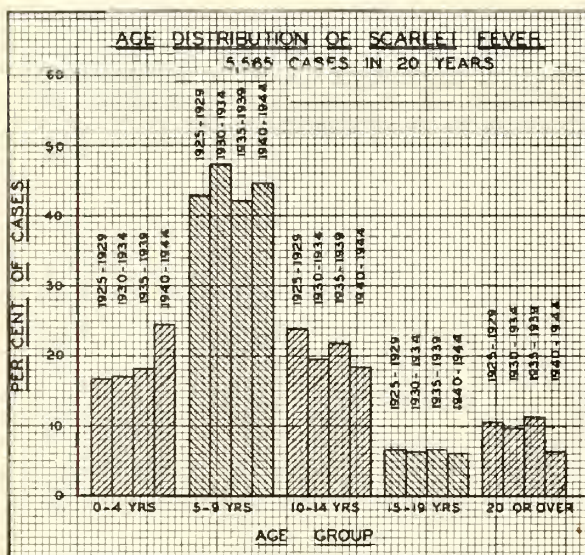


Chart IV.

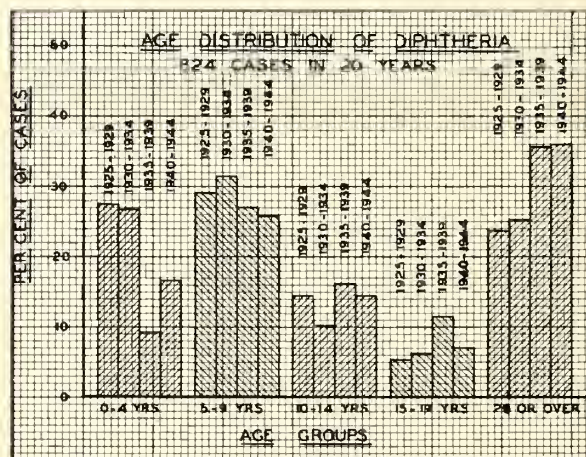


Chart VII.

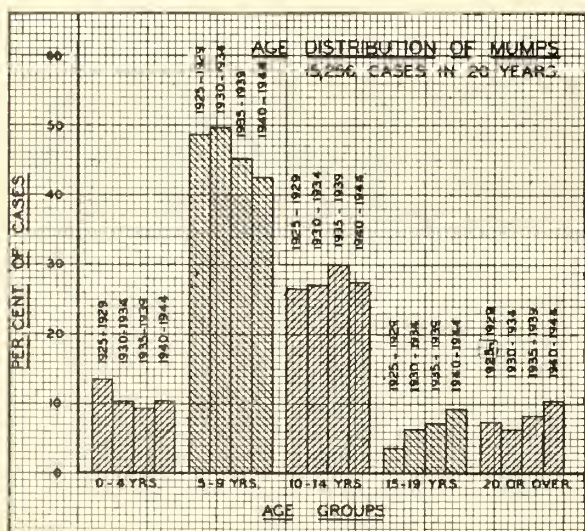


Chart V.

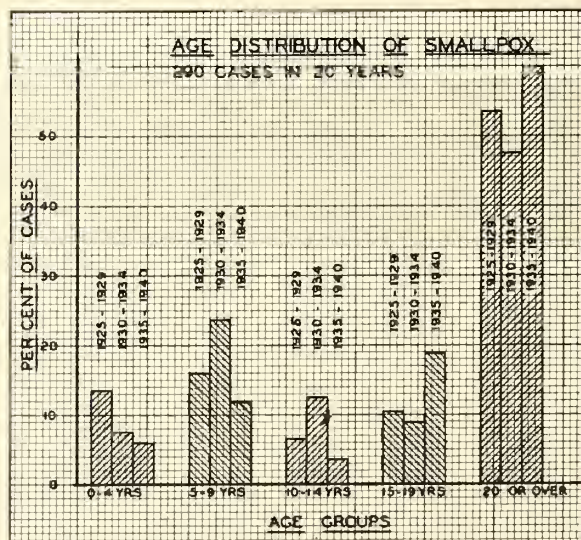


Chart VIII.

immigration in the group in which mumps increased. Several explanations may account for the shift in pertussis and the reduction in total cases in the last five years: successful immunization; modified attacks which were not recognized; or reluctance to admit failure of immunization by making a specific diagnosis. Scarlet fever, no longer a specific entity, shows slight actual change in age distribution, but there has been a reduction in the total number of cases. It cannot be claimed that isolation and quarantine have been responsible for the shift seen in poliomyelitis.

Turning again to those diseases which everyone must expect to have, much time is spent in trying to prevent infection until adult years are reached. Is this a rational objective? Adults with chickenpox, measles, or pertussis are frequently more seriously ill than are children with these infections; there are specific complications which may accompany mumps; and rubella has now been shown to be an unfortunate disease to have develop during early pregnancy. From the data available, it would appear that much of the effort has been wasted; regulations and isolation of cases and contacts have not controlled the spread of measles, mumps, chickenpox, german measles, and pertussis as judged by the number of cases and age distribution. If it is claimed that a number of people escape these infections throughout their lives as a result of these efforts, then it should be admitted that this number is no greater in San Joaquin County today than it was 20 years ago.

If present efforts have not curtailed certain diseases, should the procedure in regard to them be modified? The Health Department may have educated the public and the schools to believe that these diseases are controlled and would "lose face" in admitting failure. But it appears that factors such as the number of susceptibles in the community and their habits and environment—housing, crowding, migration—have greater influence on the spread of certain diseases than can be offset by isolation of cases and supervision of contacts.

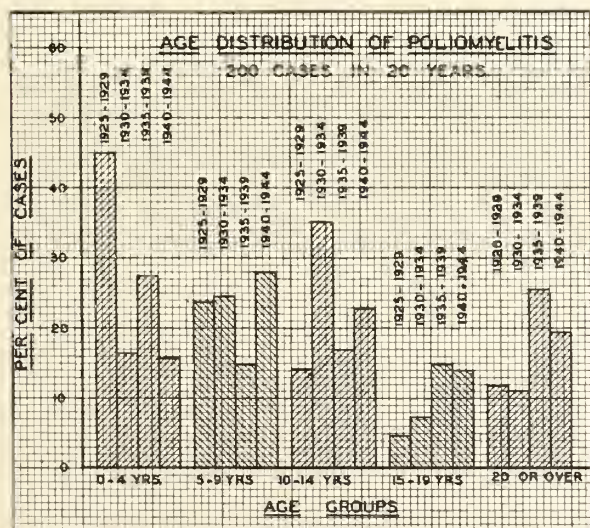


Chart IX.

If childhood is the most desirable period in which to have certain diseases can epidemics be sponsored? The schools would clamor unless they first reviewed the cases that now occur in school. While a reported sponsored epidemic (Levine's experiment with mumps) ended somewhat disastrously one may speculate on what might happen should the same course be followed for several generations. Had the parents and teacher who contracted mumps been deliberately and repeatedly exposed during childhood by similar epidemics, they would not have remained as susceptibles at the time of this experiment. His suggestion that more complications develop in cases of the third and fourth generation does not necessarily hold. Every epidemic, "controlled" or not, runs through several generations of cases. While the Health Department may not sponsor epidemics, efforts can be diverted to more profitable fields where there is promise of dividends.

SUMMARY

1. Certain of the childhood diseases have shown a change in age distribution during the years 1925-1944 in San Joaquin County. Such changes may result from:

(a) Increased protection or increased exposure of certain age groups.

(b) A change in the number of susceptibles within an age group by an increasing birth rate or migration of population.

(c) Improved reporting of cases within a specific age group.

2. For those diseases which have shown an increase in the total number of cases, protection of children does not appear to be a factor in changing the age distribution.

3. If efforts to protect the child from the common virus diseases of childhood are ineffectual, they should be modified with prevention of complications and mortality as an objective.

4. Let us see that the infant is immunized against pertussis, diphtheria, and smallpox; see that the young child has modified measles; let chickenpox come when it will; hope that mumps comes before puberty and German measles any time before pregnancy; prolong the protection against smallpox and diphtheria as long as possible.

Discussion by H. O. SWARTOUT*, M.D., Dr. P.H.

While the time available after being invited to discuss Dr. Bingham's paper was not sufficient to permit collection and analysis of comparable data for Los Angeles County, there are certain general observations that can be made. I believe the shifts in age-groups most commonly attacked in Los Angeles County by the "childhood diseases" mentioned in his paper have been quite similar to those in San Joaquin County. Recently, however, an additional important factor has tended to check the trend toward a lower average age for the incidence of some of these diseases. We have had a very large influx of working men and their families from out of the state.

* Los Angeles County Health Officer.

many of these people coming from areas either much less densely populated than ours or not carrying on as good immunization programs as ours, or both. The result has been to add many susceptibles of all ages to our population, not simply infant and small children susceptibles.

For several years before becoming Health Officer, I kept collecting figures with a bearing on what might be termed the relative inevitability or likelihood that a person would develop certain diseases some time in life. By questioning audiences of adults—sometimes combined audiences of adults and older children—I found that the following percentages of these people *remembered* having had the following diseases, or having been told by their parents that they had had them: Measles, 96 per cent; chickenpox, 95 per cent; whooping cough, 74 per cent; mumps, 46 per cent; scarlet fever, 27 per cent.

I can agree with Dr. Bingham that what we have done to prevent the spread of such diseases as measles, chicken pox, mumps, German measles, and even scarlet fever

does not seem to have accomplished much. I also agree that we should put more emphasis on means of preventing complications and lowering mortality. That under present circumstances we can "see that the young child has modified measles" in all or even in a large proportion of cases, I doubt. There are too many cases in which the *fact* of exposure is unknown until the disease develops, and too many more in which the time of first exposure is not known. Modification of measles is, of course, a good idea and should be put into practice wherever the circumstances warrant.

Scientifically speaking, even though it may seem like a throwback to the days when people said, "I want Johnny to have the measles and get it over with," I see much in favor of sponsored and controlled epidemics of some of the contagious diseases that we do not know how to prevent. I believe that you can imagine, however, what would happen to the health officer who sponsored such an epidemic, if any fatalities occurred in its course.

METHANOL POISONING *

EMIL BOGEN, M.D., *Olive View, California*

METHANOL poisoning is an important cause of disability and death in the military services. Instances have occurred in more than half a dozen different places in the Pacific area alone during the past year or so. At one station alone, methanol poisoning was observed six different times. In all, 30 persons were involved, five of whom died.

Methanol poisoning is by no means confined to the military services. Thousands of civilian cases have been reported. However, the restrictions against the use of alcohol by enlisted men in the Navy, the obstacles to successful bootlegging of potable alcoholic beverages while afloat, the general availability of methanol in many places, and the reckless avidity for intoxication notoriously exhibited by some naval personnel, all make the danger more imminent among their ranks.

Methanol poisoning may occur accidentally through inhalation of the fumes during industrial processes, or it may result from deliberate attempts at homicide or suicide. Most instances, however, are the result of taking methyl alcohol instead of ethyl alcohol in drinks. Sometimes the user sees the name and poison label, but refuses to heed it, believing it may have been placed there merely to protect beverage alcohol from thieves. Or he may think that the poisonous effect will be inconsequential in a man of his resistance or in the dilution and amounts which he intends to use. More often the poisonous nature of the liquid labeled "Methanol," "Methyl Alcohol," or "Wood Alcohol" without a poison label is not appreciated, or its presence is not recognized in a container labeled "Columbian spirits," "Wood spirits," "Methyl hydrate," "Ditto fluid," "Denatured alcohol," "Lighter fluid," "Refrigerator leak detector,"

"Alcohol for Halide Leak Detector," "Paint thinner," "Antifreeze compound," or in unlabeled containers, or mixed drinks.

Although the consumption of such liquids may be in attempted violation of the Navy orders against the drinking of intoxicating liquors by enlisted men, or may represent misappropriation of property belonging to the United States Government, none but a fanatic would hold that such an offense should be punished by the blindness or death that so often result from this form of poisoning. Accordingly, every effort should be made to prevent such catastrophes and to ameliorate their consequences if they do happen.

Opinions differ as to how containers should be labeled for greatest safety. On the one hand is the argument that the labels "wood alcohol," "methyl alcohol" and "denatured alcohol" are more likely to attract the unwary seeker for beverage alcohol than to warn him of the poisonous liquid of which he may have heard. On the other is the opinion that the contents of containers labeled "methanol," "denatured ethanol," "lighter fluid," etc., are likely to be taken because of their odor and appearance, with the imbiber ignorant of their real composition. There is general agreement, however, that every such container should bear a large and conspicuous poison label. This has been provided for in many laws, orders, regulations and agreements, etc. Thus an agreement between the U. S. Public Health Service and the manufacturers of methanol or related products provides that any material containing more than 15 per cent of free methanol shall be labeled "Poison, Contains over . . . per cent Methanol. Cannot be made non-poisonous." However, this requirement was often ignored during the war and mislabeled and even entirely unlabeled containers containing methanol were repeatedly encountered in naval facilities.

* Read before the Section on Pathology and Bacteriology, at the Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

Particularly to be deplored was the unqualified label "Alcohol" or "Alcohol for Halide Leak Detector" which was found on containers of methanol. Measures were taken to remove these misleadingly labeled containers, but several lives were lost before this was done.

An educational campaign directed at informing enlisted men of the dangers of death or blindness from drinking methanol has been carried out by some activities, by notices, lectures, and even by posting letters describing the unfortunate plight of one of the men who did lose his sight from drinking such liquor. The fact that further cases and deaths developed later in the same organization as a result of the theft and drinking, by the culprit and his ignorant friends, from a can plainly labeled "Methyl Alcohol" and "Poison" in conspicuous red letters shows that neither labeling nor education may be relied upon to safeguard completely against such tragedies.

Making methanol inaccessible to the men by eliminating it from naval stores may be feasible in some places, where it may be replaced by other agents, glycerine or ethylene glycol for antifreeze, benzine or petroleum ether for cigarette lighters, turpentine for paint thinner, carbon tetrachloride for cleaning agent, denatured alcohol for fuel, and pyridine, diethyl phthalate, etc., for denaturing alcohol. Where it is essential, in the laboratory as a solvent for Wright's stain, for instance, it is packed in small (one ounce) bottles with the dye powder to be mixed with it, and each bottle is labeled "methyl alcohol-poison." But it is also available in pint bottles, which are more dangerous although similarly labeled.

Although industry did learn to diminish greatly the use of ethyl alcohol during prohibition days, and our entire material medica was almost revolutionized by the avoidance of this substance, it would seem very unfortunate if scientific and technological workers were to be deprived of the very valuable uses of methanol. At the same time, the frequency and seriousness of its misuse demands that some precautions be taken to diminish its occurrence. This may be attempted by limiting the number of places where methanol may be kept, storing it in designated places to which only authorized persons have access, and instituting a strict method of accounting for all methyl alcohol on hand. Even this must be vigilantly supervised, since some of our worst instances have occurred through laxity in the enforcement of just such a system. But on the whole, a system of safeguarding methanol similar to that in use for narcotics might greatly reduce the chances for such catastrophes.

The denaturing of methyl alcohol by adding emetic, nauseating or otherwise distasteful materials, as is done with ethyl alcohol, might be effective, but this might interfere with its use in chemical reactions. Another possible safeguard against tragedy might be to require that substances which must be dissolved in methyl alcohol, or preparations containing it, be made under supervised conditions and sent out complete, rather

than as separate ingredients to be mixed later. But it seems probable that methanol poisonings may still only too often occur. It is well, therefore, that the physician become cognizant of the diagnosis and treatment of this condition.

Pure methanol is a colorless liquid with a characteristic odor resembling but differing distinctively from that of ethyl alcohol. Its molecular weight is about three-fourths of that of ethyl alcohol, but the specific gravity of .792 is slightly greater. It solidifies at minus 97.8°C., 15 degrees above the ethyl solidification point and it boils at 64.7°C., 13.7 degrees below the temperature at which ethyl alcohol boils. So ethyl alcohol is a more persistent, if initially somewhat more expensive, agent for antifreeze purposes. Methanol ignites at 470 degrees, nearly a hundred degrees lower than ethyl alcohol, and burns with a hot blue flame, so it is widely used as a fuel in cigarette lighters and small lamps, under the name of Columbian spirits.

The pharmacological effects of methanol may depend partly upon its chemical reducing properties, with the abstraction of oxygen from the tissues where it is being oxidized; partly upon its solubility in fat and nervous tissue, which is not, however, as great as is that of ethyl alcohol; partly on its irritating local action, and partly upon the unexplained "anesthetic effect" which it shares with the other alcohols. Some of the effect, however, has been ascribed to the products of the oxidation of methanol, the irritating action of formaldehyde, the acid production of formic acid, and other metabolites produced within the body. Other ill effects have been ascribed to impurities in the methanol itself, but these are encountered much less in the synthetic than in the natural wood spirits, with no variation in toxicity, so it seems improbable that such impurities are considerable in the ordinary case of methanol poisoning.

Despite the popular impression to the contrary, methanol is really much less toxic than is ethyl alcohol in similar doses, and due to the widespread use of the latter, many more deaths result from ethyl alcohol poisoning. However, the slow elimination of methanol in the organisms makes it accumulate during sustained drinking and remain in the body a much longer time. Hence it results in many more cases of permanent disability, especially of vision. Under the circumstances in which it is taken, moreover, there may be a greater tendency to drink the methyl alcohol in higher concentration and more rapidly than is usually the case with ethyl alcohol beverages, with consequently more occasion for large doses to be taken before the alcoholic stupor itself precludes further drinking.

LABORATORY TESTS

The presence of methanol may be suggested by its odor, its low specific gravity, its inflammability, its volatility, and other physical properties, or by its reducing action, or the formation of formaldehyde and other chemical reactions in

which it takes part. Scores of tests have been described and have been critically evaluated by extensive studies such as those of Gettler and of von Oettingen. The method for detection used in Navy laboratories is based upon the oxidation of the methanol in the presence of some ethanol by potassium permanganate, the removal of excess permanganate by oxalic acid, and the demonstration of the presence of formaldehyde in the solution by the addition of a fuchsin-sulfurous acid mixture. This test may be made quantitative by making up, at the same time a set of standards with known concentrations of methanol.

When it is known that methanol and no other alcohols are present, the amount of methanol may be determined by the same procedure used for determining ethyl alcohol in the blood or urine, etc., with potassium dichromate reagents. But if ethanol standards are used, it should be remembered that the molecular weights of the two substances differ, so that the actual methanol content is only about three-fourths of that indicated in the ethyl alcohol standard. Where it is not known how much of either is present, the results of the two methods described above, applied simultaneously, may enable calculation of the relative amounts of the two forms of alcohol.

CLINICAL FEATURES

The early symptoms of methanol poisoning are so similar to those of ordinary ethyl alcohol intoxication as to arouse little suspicion of the true nature of the condition, and many cases have suffered, accordingly, from the lack of diagnosis and early treatment. The odor on the breath may not be recognized unless specifically sought for, and may be less marked than that of ethyl alcohol. The dilated pupils, peripheral vasodilatation, with flushed face and injected conjunctiva, lessening of inhibitions and dulling of attention, alterations in form and content of speech and behavior, and muscular incoordination manifested in speech and motor activities, posture, gait, and behavior do not reveal the cause of the intoxication. With deeper methanol narcosis, constricted pupils, facial pallor, depression of pulse and respiration, and finally increasing stupor or coma may develop.

In addition to the general anesthetic or narcotic effects, however, methanol is more likely than ethyl alcohol to induce local irritative and general toxic symptoms, such as nausea, vomiting, epigastric or abdominal pain, headache, vertigo, dizziness, malaise, fatigue, weakness, numbness or pulling pains in the legs. These symptoms may develop early, together with the characteristic visual disturbances, nystagmus, pupillary changes and loss of pupillary reflexes, tenderness or pain in the eyeball, especially on pressure or movement, and difficulty in maintaining accommodation, with general blurring of vision.

More severe states are ushered in by excitement, with hallucinations and maniacal activity, or apathy, stupor and developing coma, which may be associated with increased reflexes, opisthotonus and convulsions, dyspnea which may be severe and associated with intense thirst, cyanosis, a

rapid, weak pulse and lowering of blood pressure.

Symptoms may develop slowly or temporarily remit, but are likely to increase suddenly and are characteristically more progressive in nature and much more prolonged than the corresponding stages of ethyl alcohol intoxication. The estimated fatal dose is between 100 and 250 cc, but marked variations in individual susceptibility exist, the fatal level in the blood being approximately the same as for ethyl alcohol, about 5 mg. per cc. Since the drug has cumulative effects, however, death may occur with a lower concentration. Death may come suddenly, soon after the onset of the intoxication, or following several days of coma.

The most commonly dreaded neurological effect is optic neuritis. This is usually bilateral. It may start with dimness of vision and scotomata or blind spots, and may progress slowly or rapidly to complete blindness—within a few days or even later—though some improvement may occur subsequently. Ophthalmoscopic examination may show the retinal vessels congested and dilated, blurring of the edges of the optic disc, or an optic neuritis with the presence of exudate into the retina.

Laboratory findings in acute methanol poisoning are variable, except for the presence of methanol in the tissues and body fluids and excretions. With severe acidosis, lactic and formic acid may be found in the urine. Hemoconcentration, albuminuria and even glycosuria, and elevation of blood urea and nonprotein nitrogen also have been reported.

The numerous visceral changes which have been described in reported autopsies were generally absent in the five fatal cases previously mentioned. Our most conspicuous finding in these cases was edema of the meninges and brain tissue, with slight flattening of the cerebral convolutions over the cortex and an apparent diminution of cerebro-spinal fluid. There was no cardiac enlargement, the lungs were crepitant throughout except for two instances with hypostatic congestion, the liver showed edema or congestion, without marked fatty changes, the gastric mucosa was hyperemic but appeared atrophic in only one instance, and the kidneys showed no marked changes. Perhaps the changes reported in the literature reflect the effects of prolonged and repeated drinking of irritating and toxic liquids other than methyl alcohol, as they generally resemble those described in old chronic alcoholics, and would, accordingly, be absent in the physically fit young men who had been kept away from alcoholic liquor for the most part until the chance misuse of methyl alcohol brought them to our notice.

The results of a rather intensive investigation of our cases, in which 30 participants were finally located by persistent questioning (although only nine had come in originally to complain of symptoms) suggests that in many such occasions the subjects who are only lightly or transitorily affected may not be detected. The usual mortality figures of more than 50 per cent are thus exaggerated.

gerated by being based only on the more serious cases. Although our total mortality of less than 20 per cent appears low, it includes a number of men who drank only small amounts of the methanol, and we lost more than half of the men who had actually developed serious symptoms from the liquor.

The amounts of methanol consumed by our patients varied from just a taste which was spit out to more than a pint, or eight ounces of pure methanol. Fatalities occurred only in those who took the larger amounts, and recovery in several instances followed the ingestion of as much as six ounces of methanol. Symptoms included headache, nausea and vomiting, cramps, convulsions, stupor, coma, abdominal pain, numbness in legs, blurred vision, dizziness, sleepiness, and weakness as well as the usual effects of alcoholic intoxication manifested in speech, appearance and behavior. The duration of symptoms was from one to 12 days in those who recovered, one to three days in those who died. Residual blindness has persisted in one case now for over six months.

TREATMENT

Treatment recommended for methanol poisoning has included:

(1) Stopping further absorption of the methanol by removing the patient from access to it, and emetics or gastric lavage or giving charcoal by mouth.

(2) Increasing excretion by catharsis, especially with magnesium sulfate, diaphoresis by pushing fluids, hot drinks of all kinds, sodium bicarbonate, potassium acetate, sodium citrate, and other alkaline diuretics, hot packs and hot baths, enemas, etc., and stimulating pulmonary excretion by carbon dioxide inhalation.

(3) Lowering intracranial pressure by spinal puncture, fluid restriction and dehydration therapy, especially rectal or intravenous magnesium sulfate, intravenous hypertonic glucose or sucrose, etc.

(4) Alkalinization with sodium bicarbonate, sodium lactate, or other alkaline solutions both orally and intravenously, glucose and insulin, etc.

(5) Circulatory support by venesection, adrenalin, coramine, etc.

(6) Dietary replacement with vitamins, especially thiamine.

(7) Rest, general, and local rest to the eyes with eye shades or drawn window blinds, etc.

(8) Ethyl alcohol by mouth.

Scandinavian writers, impressed by the acidosis found in methanol poisoning cases, which they ascribed to the production of formic acid from the oxidation of the methanol, and by the possibility of "competition" for chemical combinations illustrated by the interference by para-amino-benzoic acid with the sulfonamides, suggested that the administration of ethyl alcohol might be of therapeutic value in retarding methanol oxidation. The fact that cases of methanol poisoning complicated by ethanol poisoning have shown a lower mor-

talidity rate than the uncomplicated methanol cases alone, was pointed out as supporting this belief. However, the combined cases usually represent the result of the use of methanol denatured ethyl alcohol, in which the methanol content is only about 4 or 5 per cent, so that the dosages consumed are much smaller. No evidence has yet been seen that there is any such "competition" for oxygen between ethyl and methyl alcohol. The data available indicates that the oxidation rates of the two alcohols are both limited and relatively constant. The data indicates also that they are not affected by each other (or by most other things, except serious liver damage) but that the oxidation rate of ethyl alcohol is more than five times that of methanol. Accordingly, since a normal man can oxidize only about 7 grams of ethanol per hour, the usual methanol oxidation must be only in the neighborhood of one ounce per day, and the formic acid production accordingly so small and slow as to be generally of little significance, except when it occurs in localities as in the eye where it is not readily removed.

EXPERIMENTAL DATA

Although the theoretical basis for the alcohol treatment of methanol poisoning thus appears dubious, the popular attractiveness of such a treatment made it desirable to check it further. Most workers have reported that ethyl alcohol is several times more toxic than methyl, despite the popular fear of the latter drug, but that the cumulative effect of methyl alcohol may make it more dangerous if repeatedly imbibed, and blindness from methanol poisoning undoubtedly occurs in a conspicuous fraction of those who consume methanol. Accordingly animal experiments were undertaken for this purpose. A total of 100 guinea pigs were used. Most of them had been infected previously with tubercle bacilli in connection with another experiment. Twenty-six were given ethanol, usually 30 grams, intraperitoneally, and 26 were given similar amounts of methanol, while 48 were given combinations of these two alcohols, in amounts totaling the same as that of the single doses in the previous sets. Altogether, 18 of the animals given ethyl alcohol alone died within six hours. Eighteen of those given the combined alcohols, and only eight of those given the methyl alcohol alone, died in this time. At autopsy there was still some unabsorbed alcohol present in the peritoneal cavity of most of the animals, and more would have died if the experiment had continued, but the greater toxicity of ethanol, and its futility in the treatment of methanol seemed evident.

SUMMARY

1. Methanol, or wood alcohol, poisoning may occur despite adequate labeling, warnings, educational campaigns, and measures to restrict the availability of the substance or to make it less attractive. All such preventive measures should be used, however, to lessen the frequency of these catastrophes.

2. Although less toxic than ethyl alcohol in acute animal experiments, its cumulative properties and

the amount and manner of its use results in a higher lethal rate among humans affected by it.

3. Symptoms of methanol poisoning generally resemble those of ordinary intoxication, but its more protracted course, greater frequency of eye symptoms, and especially the history of consumption of a suspicious liquor may lead to its recognition, which may be confirmed by laboratory tests. Many milder cases, however, go unrecognized. Treatments are directed especially at prevention of further absorption, increase in excretion and neutralization of the toxic effects of the methanol and its oxidative products, with especial attention to alkalinization, stimulation, lessening cerebral edema, and visual protection. The recommendation of ethyl alcohol in the treatment of methanol poisoning could not be supported by clinical or experimental observations.

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Comparative Roentgenographic and Microscopic Patterns in Bone Tumors*

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ONE tumors represent a group of neoplasms in which cooperative clinical and laboratory effort and acumen must attain their highest expression to achieve any satisfactory approach to accurate diagnosis and rational treatment. Pathologists, radiologists, and surgeons alike frequently regard the roentgenogram, the gross specimen and the tissue section as a fixed pattern, rather than a phase in neoplastic development modified by reactive changes in the tumor bed almost as variable as moving images on a screen. The kinetic concept of a developing pattern of morbid changes in tissue is, of course, fundamental in surgical pathology, and is of essential value in neoplasms of bone.

Some radiologists in recent years have suggested that diagnosis of bone tumors by radiographic methods is as accurate as by histological section. This untenable position has been fostered by diagnostic errors by microscopists, often due to the pathologist's failure to recognize that he should have complete historical, clinical and roentgenographic information on which to base his interpretation of cellular changes.

The radiographic changes and the gross appearance of bone tumors can be interpreted generally as a balance between the activity of the tumor, and the reactive stromal response evoked by the

neoplasm. Specifically, the features of importance are osteolysis, its opposite phenomenon osteosclerosis, bone production either tumor or reactive bone, calcification, and vascular changes. The absence or degree of these features, their modification according to medullary, cortical or periosteal sites, the age of the individual, particularly in lesions involving epiphyseal areas, all contribute to the varying pattern which may be produced.

The classification presented here is an attempt to derive bone tumors according to their histogenesis. The relation between radiographic and histopathologic changes will be illustrated by cases from the connective tissue and giant cell groups.

Osteosarcoma is most commonly a sclerosing peripheral tumor. The striae which are frequently seen at right angles to the shaft represent new bone laid down in more or less parallel rows and are simply a phase in growth pattern which is by no means constant. Ordinarily, those osteosarcomas which form an osteoid matrix are exhibited roentgenographically as dense areas subperiosteal in location with elevation of the periosteum. The edge of the advancing periosteal elevation marks the advancing front of the tumor, and is known as Codman's reactive triangle. The aggressive, highly anaplastic and extremely vascular form of osteosarcoma is the aneurysmal form of osteolytic sarcoma.

But there are seldom pure examples of sclerosing or osteolytic forms, and some of these tumors exhibit equal tendencies toward both forms. Soft

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tissue extension may be attended by blotchy masses of radiopacity which are further new bone production.

Chondrosarcoma is also most often peripheral, and productive rather than sclerosing. The central lesions are usually destructive, but may be intensely sclerotic or eburnating. The outstanding histologic feature of chondrosarcoma is the calcification which takes place in the productive forms, which may produce blotchy masses, lobulated outlines, or may line up in parallel striae simulating osteosarcoma.

Fibrosarcoma is essentially an osteolytic process, seen in either early or advanced stages. In the latter, it frequently forms multiple pseudo-cystic areas, which belie their "cystic" nature because of the irregularity of the "cyst" wall as well as the adjacent reactive sclerosis. Still further advanced, this lesion exhibits a diffuse, linear sort of rarefaction, a ragged, moth-eaten appearance simulating advanced Ewing's sarcoma. Such tumors show a pure replacement of bone with fibrosarcoma. As in soft tissues, some fibrosarcomas differentiate toward osteoblastic structure and ossify, or develop areas of chondrosarcomatous material.

There is thus no pure pattern of bone neoplasms, nor can the radiologist distinguish with certainty between primary and metastatic lesions. A tumor of the distal end of the femur was so "characteristic" radiographically of osteosar-

coma, that amputation was done without biopsy, but pathological examination showed it to be a metastatic adenocarcinoma, eventually proven to be primary in the prostate. Another bone lesion which by x-ray examination suggested either Ewing's sarcoma or a suppurative infection, proved on biopsy to be a metastatic carcinoma.

Giant cell tumors exhibit a multi-cystic structure, usually in epiphyseal areas, with distinct lines of demarcation from the unaffected bone. The periosteal contour is not destroyed or elevated, although it may be distorted by the expansile tumor. The histopathology is that of replacement of cancellous structure by tumor in a specific form, the epiphyseal chondromatous giant cell tumor of children, usually occurring in the upper end of the humerus, the microscopic picture may be alarming, but the radiographic appearance conforms to that of benign giant cell tumor elsewhere.

Thus the pathologist and radiologist are interdependent in the diagnosis of bone tumors. The final arbiter is the histopathologist, as he is in establishing any tissue change. He must, however, recognize that the intelligent diagnosis of bone lesions is inextricably associated with their radiographic appearance. The whole picture, with a clinical background, represents a pattern of neoplastic activity and response by the stroma of the host, which taken together are a summation of the neoplastic process which leads to accurate pathologic diagnosis.

MODERN TREATMENT REDUCES MENACE FROM TOXIC GOITER

"With judicious use of x-ray therapy in some instances, surgery in others, and a combination of iodine or thiouracil treatment with surgery in still others, the prospect for 100 per cent control of toxic goiter is indeed bright," writes W. W. Bolton, M.D., of the Bureau of Health Education, American Medical Association.

Dr. Bolton's article, appearing in the current issue of *Hygeia*, health magazine of the American Medical Association, states that "for many years, iodine was the only recognized specific treatment which was of any benefit in control of toxic goiter. But because it was not always effective, or perhaps kept thyroid activity reduced for a short time only, search for helpful measures continued. A genuine boom was introduced with development and refinement of surgical procedures. Techniques were devised for removal of enough of the thyroid gland so that what remained carried the body on a normal metabolic rate."

Another approach to the goiter problem is based on studies which have shown that the "secretion of the anterior portion of the pituitary gland, which is located

deep within the skull, has a stimulating effect on thyroid function," the author says. "With this knowledge, in certain instances when signs of thyroid hyperactivity appear, it is possible to reduce output of pituitary secretion and remove its whipping effect on the thyroid by x-ray treatment of that gland."

The author points to thiouracil as another late development in the control of excessive thyroid activity. "This chemical, first investigated in 1943, has the power to bring about, often in an amazingly short time, prompt subsidence of thyroid activity to normal. Best of all, once the hyperactivity has been checked, the gland shows no tendency to 'run wild' again, even though use of thiouracil may be discontinued. Final evidence regarding thiouracil has not yet been obtained. It is a potent drug, and indications are that it must be used cautiously and under constant medical supervision.

"Even more recent is the use of radioactive iodine produced by the use of cyclotron," he says.



MEDICAL PROGRESS:

Recent Progress In The Treatment Of Thrombo-Embolic Disease

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INTEREST in the problems of venous thrombosis and pulmonary embolism has increased rapidly during the past decade. This interest has been stimulated to a great extent by the controversy which has arisen as to the best method of prevention and treatment. The heat of controversy has fortunately been accompanied by considerable light shed upon the fundamental problems involved. Equally fortunate for patients suffering from these conditions is the fact that these new therapeutic measures have all brought great reductions in morbidity and mortality in comparison with the results obtained by the time-honored expectant treatment of rest, elevation and the application of heat.

Primary consideration in the treatment of thrombo-embolic disease should necessarily be given to reducing the mortality from pulmonary embolism. Of importance also are efforts to decrease the morbidity from thrombosis and the disabilities arising from thrombophlebitis.

INCIDENCE

Consideration of the incidence of thrombosis and pulmonary embolism serves to call attention to the conditions under which these complications are likely to arise. The percentage of cases of thrombo-embolism encountered in the course of routine hospitalization is small. In 172,888 records of surgical patients at the Mayo Clinic⁶ only 0.96 per cent suffered this complication. The incidence in 125,524 postoperative cases reported by Zilliacus⁵⁰ was 0.51 per cent. In selected groups of patients, however, such as those subjected to extensive abdominal operations for cancer, abdominal hysterectomies, prostatectomies and operations on the biliary tract the number of cases increases considerably. Crafoord and Jorpes¹⁶ report a 9 per cent incidence of thrombo-embolism in 1,111 cases of this nature. Murray and Best³⁶ have shown a similar high incidence in patients operated on at the Toronto General Hospital. Pulmonary embolism has been found to be the most common cause of death after fractures of the hip by Golodner, Morse and Angrist.²⁴ The increased incidence of pulmonary embolism in obese patients first pointed out by Snell⁴⁵ has been emphasized by Ochsner.³⁸

When careful search for antemortem thrombosis has been made in the course of postmortem examinations in an unselected group of cases, an

astonishingly high incidence of intravascular thrombosis has been found. Rössle³² found that the veins of the calf harbored thrombi in 27.1 per cent of 324 patients over 20 years of age. In their first report, Hunter³⁰ and his colleagues found thrombosis of the deep veins of the leg in 52.7 per cent among 351 middle-aged and older persons forced to bed for varying periods of time. Pulmonary embolism, however, was the cause of death in only 3.13 per cent of the deaths. It is highly probable that intravascular thrombosis occurs far more frequently than it is recognized and that many cases subside spontaneously without complications.

Analysis of the cases of fatal pulmonary embolism with respect to the clinical condition from which the patient was originally suffering calls attention to the wide field in which the problem of thrombo-embolism is present. Only 40 per cent of the 370 cases studied by Hampton and Castleman²⁵ followed operation. Cardiac disease was a predisposing factor in 30 per cent and patients suffering from general medical conditions accounted for the remaining 30 per cent. As Hunter³¹ has remarked, "The greatest single factor favoring thrombus formation in the lower extremity is sudden confinement to bed of a previously ambulatory older person."

Whereas the incidence of thrombo-embolism is relatively low in the general run of clinical conditions, once intravascular thrombosis has occurred, as manifested by thrombophlebitis, phlebothrombosis or pulmonary infarction, the frequency of subsequent pulmonary embolism is alarmingly high. In 897 cases of thrombophlebitis reported from the Mayo Clinic by Allen, Barker and Hines,⁴ subsequent pulmonary embolism occurred in 15.6 per cent and the embolus was fatal in 5.7 per cent. In 678 patients who survived an initial pulmonary embolus, subsequent embolism took place in 30.5 per cent and in 18.3 per cent fatal pulmonary embolism occurred. Bauer⁹ over a ten-year period observed a mortality from pulmonary embolism of 18 per cent in 264 cases of thrombosis. The significance of these findings was emphasized by Barker⁶ and his co-workers: "If all fatal embolisms which were preceded by a clinically diagnosed nonfatal embolism could be prevented, the total number of fatal embolisms would be reduced by more than a third." If, in addition, all the clinically recognizable cases of thrombosis could be satisfactorily treated, the incidence of fatal pulmonary

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embolism might be reduced to a considerable degree.

Two problems in diagnosis arise in thromboembolism, that of intravascular thrombosis and that of pulmonary embolism.

Thrombosis. The location of the intravascular thrombosis in the great majority of cases has been in the lower extremities. From combined clinical diagnosis and incidental necropsy findings 96.8 per cent of the cases were found by Allen, Barker and Hines⁴ to involve the veins of the lower extremities. Bauer⁹ believes that the origin of the thrombosis in thrombo-embolic disease is in the lower extremities in 98 per cent of the cases. Early diagnosis of thrombosis in the veins of the leg is therefore to be sought. It is important at this time to emphasize the difference in the clinical picture presented by thrombosis occluding the femoral and iliac veins, the so-called phlegmasia alba dolens, with its readily recognizable swelling, pain and fever, and the more insidious thrombosis originating in the veins of the foot or calf. This latter condition Homans²⁷ has termed "deep quiet venous thrombosis" while Ochsner and DeBakey³⁹ have identified it as "phlebothrombosis." Bauer⁹ prefers the designation "acute thrombosis of the deep veins." Distinction between the two conditions is important since the bland thrombosis starting in the leg frequently gives no signs or symptoms of its presence until pulmonary embolism occurs. The first indication of venous thrombosis in 41 per cent of the 202 cases reviewed by Allen, Linton and Donaldson¹ was pain in the chest. Of greater significance in the early diagnosis of thrombo-embolic disease in their patients was an unexplained simultaneous elevation of the temperature, pulse and respiration on the clinical chart. This sign was the first one noted in 81 per cent of their series. Careful examination of the legs in all patients in the older age group who are confined to bed should be a routine daily practice. Tenderness over the calf, increased warmth of the skin over the calf or foot and pain or restriction of motion on dorsiflexion of the foot, which Homans²⁸ calls the "dorsiflexion sign," may indicate early thrombosis in the deep veins of the leg. Observation of the difference in the rate of drainage of blood from the soles of the feet upon moderate elevation has, in my experience, been useful in detecting early changes in the efficacy of venous outflow. A method of differentiating the tenderness due to thrombosis of the veins of the calf from tenderness of the muscles due to other causes was suggested by Moses.³⁴ He first examines the deep structures of the calf by pressure with the tips of the fingers. Tenderness elicited by this procedure is then compared with that produced by lateral pressure on the calf muscles. Phlebography, once advocated for the early diagnosis of deep thrombosis of the leg, has not been found a reliable means for establishing the diagnosis in the hands of most observers. Phlebograms are difficult to interpret and spasm of the larger veins, which has clearly been demonstrated by

Papper and Imber,⁴¹ may be misleading. Bauer,¹⁰ on the other hand, has developed a standard technique whereby the deep veins of the leg, particularly the peroneal veins, are filled by a slow injection of contrast medium into the short saphenous system. The vein is exposed by a small incision behind the lateral malleolus and the needle temporarily tied in place. Films are taken in two planes at 50 and 60 seconds during the injections. His studies on the pathogenesis of thrombosis of the deep veins of the leg have been an outstanding recent contribution.

Pulmonary Embolus. Since pulmonary embolism is frequently the first clinical evidence of intravascular thrombosis, early diagnosis of this condition is urgent in order to prevent recurrence. The classical picture of sudden pain in the chest, dyspnea and hemoptysis is by no means universal. Nor is it necessary for the patient to have been confined to bed. Homans²⁸ was the first to call attention to the development of pulmonary infarction in apparently healthy adults. Careful examination was necessary in order to disclose the site in the legs from which the emboli arose. Hampton, Prandoni and King²⁶ have reported ten cases of pulmonary embolism from obscure sources. The patients were all healthy adults who were admitted to the hospital for acute pulmonary conditions. The diagnosis of pulmonary infarction was made on the basis of x-ray examination of the chest, electrocardiogram and phlebography. Except in one of the cases, there was no obvious sign of venous thrombosis. Recovery took place in all patients following treatment with anticoagulants. The x-ray diagnosis of pulmonary infarction has been carefully investigated by Hampton and Castleman,²⁵ both in the living patient and at autopsy. The site of lodgment of the embolus was in the lower lobes in 74 per cent of their cases with slight preference for the lower lobe on the right side. They have stressed the fact that the area of infarct is always in contact with one of the pleural surfaces and that the border towards the heart when viewed from the correct angle always presents a peculiar "hump." Embolism need not produce infarction. In a number of their cases spontaneous resolution occurred. To this process they have given the term "incomplete infarction." Because of the changing appearance over a short space of time they advocate repeated examinations in cases who are suspected of having suffered a pulmonary embolus. Repeated electrocardiographic examinations are indicated in the doubtful cases for the same reason.

ETIOLOGY AND PREVENTION

Three etiological factors responsible for thrombosis have been emphasized by deTakats and Fowler,¹⁸ slowing of the circulation, changes in the vessel wall and increased coagulability of the blood. Methods of prevention will be considered in the light of these etiological factors.

Slowing of the circulation. Since it is recognized that confinement to bed of a previously ambulatory older person is the most important

predisposing factor in thrombosis, active exercise, especially of the legs, is strongly advocated. Hunter³¹ and his associates found that the incidence of thrombosis noted at postmortem examination was reduced to one-third by the institution in the medical department of exercises for the patients. Shaw and Richards⁴⁴ found that post-operative embolism was reduced to one-fifth by the institution of regular exercise periods. The importance of supervised exercise in the postoperative period was stressed by Ochsner.³⁸ At the times that the patient is having his pulse and temperature taken by the nurse he should routinely raise and extend his feet at the ankle. The tight sheets of the neat hospital bed, though esthetically satisfying, facilitate the development of thrombosis by extending the feet and thus producing maximal relaxation of the flexor muscles of the calf. With the patient on his side, however, active movements of the lower extremities can be readily carried out without the production of pain. Even in case that the patient's leg is enclosed in a plaster cast, he can still obtain the advantage of muscular activity by alternately contracting and relaxing his muscles. Bauer¹¹ has urged this form of exercise, which is particularly important after injuries of the lower extremities, since he has shown that the incidence of thrombosis is in these cases as high as 12 per cent.

It was hoped that "early ambulation" in the postoperative period would bring about a decrease in the incidence of thrombo-embolism. As this procedure is not frequently being carried out, these hopes have not been realized. In fact Blodgett and Beatty¹² have shown that the incidence of thrombo-embolism may actually be increased. Since it is the actual movement which appears to have a beneficial effect and since simply sitting in a chair by the bedside promotes stasis in the veins of the leg it would appear to be a better policy to have the patient get out of bed, walk about a short time and get in again. Once the patient is fully ambulatory and can walk to and fro, the need for supervised exercise is past.

Other measures designed to improve the circulation have been advocated by numerous observers. The importance of elevating the foot of the bed to prevent venous stasis has been repeatedly stressed. Application of pressure to the legs by means of compression bandages in all patients over the age of 45 who undergo an extensive operative procedure has been advocated by Ochsner.³⁸ It is a logical form of prevention since compression will empty the veins in which blood is not flowing and will speed-up the flow of blood in veins which are carrying the blood to the heart. This compression treatment, which was first advocated by Fischer²³ is especially useful for acute thrombophlebitis. Rapid subsidence of the inflammatory process is facilitated. The exact means by which compression favors resolution is obscure but it may depend upon improving the distribution of blood flow to the peripheral tissues. Chapman and Linton¹⁵ have suggested an explanation of the mechanism by which

emboli are broken off to be carried to the lungs during activities associated with straining movements on the part of the patient with the glottis closed. They believe that forceful expiration under these conditions, the so-called Valsalva experiment, causes a sudden backing up of the venous stream with ballooning out of the great veins of the lower half of the body. With the subsequent sudden release of pressure associated with inspiration, the venous pressure falls sharply and if there is a poorly organized thrombus floating in one of the larger veins it may become detached or a part may be broken off during these abrupt changes in venous pressure.

Another factor which is probably of significance in the retardation of the circulation is reflex vasoconstriction due either to temperature changes or to the traumatic stimuli associated with the illness or operative procedure. The increased incidence of thrombo-embolism during the winter months has been noted by Allen, Linton and Donaldson.² Naide and Säyen³⁷ have found that the proportion of patients who had previously developed thrombophlebitis who exhibited an abnormally high vascular tone was greatly in excess of normal. It is likely that vasoconstriction which affects the veins as well as the arteries may be of real significance in promoting vascular stagnation.

Endothelial damage. Thrombosis is naturally favored by damage to the intima of vessels though efforts to relate this fact to clinical conditions have been disappointing. Jensen³² has demonstrated pathological changes in the walls of veins at a level considerably above the region where thrombosis has occurred. Attempts by Tannenberg⁴⁶ to produce thrombosis from allergic reactions in the walls of veins by the administration of bacterial toxins in sensitized animals were unsuccessful. Gross trauma to veins will produce thrombosis and this thrombosis can be prevented by regional or general heparinization as shown by Murray and Best,³⁶ but the importance of this factor in initiating clinical thrombosis is not yet clear. It seems likely that the high incidence of thrombosis in the leg after trauma noted by Bauer¹¹ is dependent upon direct injury to the vessels.

Increased coagulability of the blood. Increased coagulability of the blood following trauma and operations has long been recognized. Wright⁴⁹ has recently demonstrated not only an increase in the number of platelets in the circulating blood after operations or child-birth but also an increase in the adhesive quality of the platelets. Anticoagulants reduce the adhesiveness of the platelets. An increase in the concentration or activity of prothrombin has been demonstrated by Brambel and Loker.¹³ They found that by using plasma diluted to 12.5 per cent they were able to demonstrate finer variations in the prothrombin time in the blood. Significant increases were observed after operations and after delivery. Of particular significance were their findings of increased prothrombin activity in cases of phlebitis and after stopping the administration of dicou-

marol. Shapiro⁴³ suggested the use of this test in differentiating pulmonary embolism from other conditions. He advocated its use in the selection of cases in whom thrombo-embolism was likely to occur. Increased tolerance to heparin following operations was first noticed by Crafoord and Jorpes¹⁶ when they began to use this substance prophylactically in surgical patients. The heparin tolerance test to select patients who might be subject to thrombo-embolism was suggested by deTakats.¹⁹ According to this test the clotting time is measured with a capillary tube 10, 20 and 30 minutes after the intravenous injection of 10 mgm. of heparin. The heparin tolerance was found to increase for the first 3 to 4 days after operation.

Comment. Although recent reports on altered coagulability of the blood as a predisposing factor in the origin of thrombo-embolism are highly suggestive, they do not yet offer much help from the standpoint of prevention. The laboratory determinations are difficult and require highly trained technical assistance. Although the observations are extremely interesting and important for an understanding of the pathogenesis of thrombo-embolism no laboratory test has yet been devised by means of which the individual who will develop intravascular thrombosis can surely be identified.

PROPHYLACTIC TREATMENT

Over the question of the best method of prophylactic treatment of thrombo-embolism the controversy has been the most active. Since both vein ligation and the use of anticoagulants have yielded excellent results in reducing the mortality from pulmonary embolism the advocates of each method have vigorously insisted upon the advantage of their method. Enough time and a sufficient number of cases have now accumulated so that an appraisal can be made.

Vein ligation. All who have had the unhappy experience of watching a thrombosis of the calf ascend and even terminate with a fatal pulmonary embolus cannot help but be impressed with the dramatic results which follow ligation of the vein ahead of the propagating thrombus. Similarly, in the patient who is desperately ill after repeated sub-lethal pulmonary infarcts, the rapid improvement when the vein through which these emboli pass is safely tied off, marks this procedure as a life-saving measure. Allen³ has recently summarized the results of interruption of the femoral veins in 816 patients at the Massachusetts General Hospital. There was but one death from massive pulmonary embolus following this procedure. Because of the high incidence of involvement of the veins of both legs, bilateral ligation was practiced with rare exceptions. In the last year for which statistics were available 98.2 per cent of the ligations were bilateral. This procedure was used for prophylactic purposes in an increasing number of cases, so that in 1945 over one-third of the ligations were performed for this reason. The indications for ligation in the remain-

ing cases were approximately equally divided between pulmonary embolism and venous thrombosis in the legs. Numerous reports have come out on ligations of the veins at higher levels, common femoral (Fine and Starr²²), iliac (Bancroft,⁵ and Homans²⁷) and vena cava (Veal and Hussey,⁴⁷ O'Neil⁴⁰ and Moses³⁵). Although there may be occasional instances in which ligations at these higher levels are indicated, the very fact that anticoagulants have had to be used^{5,20} after these high ligations in order to prevent further thrombosis and embolism casts doubt on the necessity and the advisability of such radical procedures. Although ligation of the superficial femoral vein distal to the profunda is seldom followed by signs of venous impairment, ligation of the common femoral vein may have disastrous results. Dennis¹⁷ has reported such a case and Homans²⁹ states that he has encountered two similar ones. deTakats and Fowler¹⁸ find that ligation of the femoral vein above the profunda invariably results in considerable edema. Although ligation of the common iliac vein and even of the vena cava may allow for a better development of collateral circulation, and Veal and Hussey⁴⁷ have commented on the remarkable restoration of function which occurs after ligation of the vena cava, yet accurate studies show the degree of venous insufficiency which follows interruption of the veins at such high levels. Burch and Winsor¹⁴ studied the venous pressure in the feet of five patients in whom the inferior vena cava was ligated for septic phlebitis. All but one of the patients showed edema up to ten months after operation and the venous pressure in all cases was considerably increased with diminution in the digital oscillations. They found, however, that there had been remarkable compensation. Allen,³ in summarizing the experience with vein ligation at the Massachusetts General Hospital, has concluded that "common femoral vein interruption is not recommended in spite of one fatal embolus from the profunda femoris vein after superficial femoral interruption. Serious sequelae can occur under certain circumstances from common femoral vein occlusion. The technical difficulties far outweigh any added protection to the patient."

Comment. Vein ligation has a very significant place in the treatment of thrombo-embolism. It is especially called for in patients who have had a warning embolus and in whom careful examination reveals signs of thrombosis in the leg. Under such circumstances both superficial femoral veins should be ligated. Again, evidence of thrombosis in the leg in a patient who for some reason cannot be mobilized calls for bilateral superficial femoral vein ligation. Finally, in cases that the use of anticoagulants is contraindicated, vein ligation may be a life-saving measure. Because of the high incidence of embolism after vein ligation in case that the thrombosis has extended above the superficial femoral vein, there appear to be few indications for ligation above this level.

ANTICOAGULANTS

Heparin. Many favorable reports on the use of anticoagulants for the prophylaxis and treatment of thrombo-embolism have been published. With the use of heparin by continuous intravenous drip, Murray and Best³⁶ in 1938 reported the successful prophylactic treatment of 315 surgical cases without a single case of thrombo-embolism. Furthermore, in seven cases of pulmonary embolism and 28 cases of thrombophlebitis there was no recurrence. Crafoord and Jorpes¹⁶ in 1941 presented the results they had obtained by the use of heparin given in repeated intravenous injections four times daily. The incidence of thrombo-embolism in over 1,000 cases in the control series was 9 per cent. With the use of heparin in 325 cases there was not a single instance. Bauer⁹ has recently summarized his experiences with the administration of heparin in the treatment of thrombosis and embolism over a five-year period. Before the use of heparin, in 264 cases in which the diagnosis of thrombosis had been made, there were 47 deaths, a mortality of 18 per cent. During the five years, with the use of heparin, the diagnosis of venous thrombosis was made and generally confirmed by phlebography in 209 cases. There were but three deaths, a mortality of 1.4 per cent. Only one of these patients was under the influence of heparin at the time of the fatal embolism. Bauer⁹ has outlined a plan for the treatment of thrombo-embolism which is commendable for its efficacy and simplicity. The general principles of this plan are essentially (1) early diagnosis, (2) immediate heparinization, (3) active exercises of the legs from the beginning, and (4) early mobilization during the period of heparinization, with a tapering off of the administration of the drug. An initial dose of 150 mgm. of heparin is injected intravenously as soon as the diagnosis is made, followed by one or two more similar doses the first day, depending upon the time of day in which the treatment is started, but never at closer intervals than four hours. On subsequent days the patient is generally given 150 mgm. at night and in the morning, with 100 mgm. at midday. In the mild case this active heparinization is continued for but three to five days and the dosage is then tapered off by omitting one or more doses each day. In the presence of massive pulmonary embolism or extensive thrombophlebitis larger doses of heparin are required. If the patient is not ambulatory the treatment is carried on for a longer period of time. Bauer⁹ has emphasized the fact that recurrence of the thrombosis and embolism is apt to occur if the drug is withdrawn too suddenly, and he has strongly advocated the early mobilization of the patient while under the influence of the anticoagulant. Not only was the incidence of pulmonary embolism reduced to low levels by this form of therapy but the process of thrombosis was definitely arrested. In case that the venous system of the lower leg alone was involved at the time treatment was started and

the process arrested at this point, the development of collateral venous circulation was most satisfactory and the resultant post-phlebotic difficulties minimal. In case that the femoral vein was already involved at the time the anticoagulant was started, some disability generally resulted. Early treatment with heparin not only lowered the mortality to one-tenth but the period of hospitalization was greatly reduced. Complications from bleeding were rare with this form of treatment, there being three cases of hematuria and two patients who developed hemarthrosis. It is interesting to note that Bauer does not mention the necessity of controlling the dosage of heparin by determinations of the clotting time. It is well known that the depression of the clotting time following intravenous administration of heparin is not evenly sustained (Walker⁴⁸) and so with this intermittent type of administration there must be periods during the 24 hours when the patient is not protected against intravenous thrombosis. On the other hand, the clinical results reported with the intermittent heparinization are so uniformly favorable that the need for continuous administration may be questioned, especially since the complicating factor of hemorrhage may be avoided by the less intensive form of treatment. Administration of heparin in Pitkin Menstruum, a form which allows it to be slowly released over a two-day period, has been developed by Loewe³³ and his associates. Favorable results with this form of treatment were reported in 125 cases, although there were four cases of fatal embolism. They advocated prolonged treatment, 10 to 14 days for uncomplicated thrombophlebitis and three to four weeks after pulmonary embolism. The need for such prolonged therapy may be questioned, especially in case that active mobilization is feasible after a short period of heparinization. The use of heparin/Pitkin in combination with dicoumarol has been advocated by Evans and Boller.²¹ The two drugs are given simultaneously and the heparin effect on the clotting time wears off at just about the time that the depressant effect of the dicoumarol on the prothrombin level becomes effective.

Comment. Heparin, according to all reports, is effective in the prevention of thrombo-embolism. Its action in arresting the process of intravascular thrombosis is especially desirable. It is, however, expensive and its administration cumbersome. Control of the dosage by determinations of the clotting time is not difficult and the occurrence of complicating hemorrhage has been reported only rarely.

Dicoumarol. Dicoumarol, the hemorrhagic agent from spoiled sweet clover first isolated and synthesized by Link, prevents the formation of prothrombin in the liver. It has been extensively used in the prevention and treatment of thrombo-embolism. In 1,000 cases reported by Barker, Cromer, Hurn and Waugh⁷ from the Mayo Clinic, there was but one death from pulmonary embolism and this embolism occurred after the prothrombin had returned to normal because the

Dicoumarol had been given for insufficient time. This record is the more impressive since Dicoumarol was used in 379 cases of thrombosis or embolism in which the incidence of subsequent thrombo-embolism is so high. This drug is given by mouth, 200 mgm. to patients under 150 lb. in weight and 300 mgm. in those who weigh over 150 lb. The prothrombin time must be accurately checked before the administration of any more Dicoumarol since 27 per cent of 340 consecutive patients studied by Barker and his associates were hypersensitive to the drug. In cases of hypersensitivity the prothrombin may fall to less than 10 per cent of normal after the first one or two doses or after subsequent doses. Serious bleeding may take place under these circumstances. The full effect of the administration of Dicoumarol does not occur for 24 to 48 hours and sometimes even longer. Again, the prothrombin deficiency may continue for from two to ten days after the last dose of Dicoumarol has been given. Barker and his associates recommended that the prothrombin level be kept between 10 and 30 per cent of normal by the administration of 200 mgm. of Dicoumarol on each day that the prothrombin was greater than 20 per cent of normal. In the first 497 cases in whom Dicoumarol was used postoperatively to prevent thrombo-embolism Barker, Allen and Waugh⁸ reported bleeding of some degree in 47, an incidence of almost 10 per cent. In 4 per cent the bleeding was more than slight and there was one fatality. In this case the prothrombin time was only 28 seconds, so that the part played by Dicoumarol in the production of this fatal hemorrhage may be questioned. In all the remaining cases of moderately severe or severe bleeding the prothrombin time was in excess of 60 seconds. Evans,²⁰ in reporting on the use of Dicoumarol in 55 cases encountered hemorrhages in eight patients with two fatalities. In a recent report²¹ he has reduced the dosage of Dicoumarol to 100 mgm. and this dose is given only after the prothrombin time has been found to be above 65 per cent. deTakats¹⁸ attempts to maintain the prothrombin level between 60 and 30 per cent. Prothrombin deficiency due to the action of Dicoumarol can be effectively counteracted both by transfusions of fresh whole blood and by the intravenous administration of synthetic vitamin K in the form of Menadione bisulfite. According to Barker,⁷ a single dose of 64 mgm. was sufficient in 35 of the 37 patients who were treated for this complication, to bring the prothrombin time down to a safe level. The possibility of precipitating a recurrence of thrombosis with such large doses should be kept in mind. deTakats¹⁸ has reported two cases in whom fresh vascular accidents appeared to coincide with the administration of the vitamin.

Of great interest is the recent report by Allen³ on the use of Dicoumarol in small dosage for the prevention of thrombo-embolism at the Massachusetts General Hospital. In a well-controlled series of 101 cases, 200 mgm. of Dicoumarol was administered to patients between the ages of 40

and 65 on the second or third day after operation. In ten patients in this series a second dose of Dicoumarol was given. There were but three instances of thrombo-embolic complications and in two of these the dosage of Dicoumarol had no appreciable effect on the prothrombin time. In the control group who "were comparable in every respect to those in the same age group receiving Dicoumarol" there were 14 instances of thrombosis requiring vein interruption. In those receiving Dicoumarol there were no undesirable sequelae which could be definitely attributed to the use of the anticoagulant. Although this series is too small for the results to be statistically significant, the observations are extremely interesting in that they suggest the possibility of administering Dicoumarol in dosage small enough not to produce the complication of hemorrhage but yet sufficient to reduce very substantially the complication of thrombo-embolism. In addition, the small dosage given may permit the routine administration of Dicoumarol without the necessity of the highly specialized determination of the prothrombin time.

Comment. There are numerous contraindications to the use of Dicoumarol: (1) hepatic or renal disease, (2) blood dyscrasias, (3) recent operations upon the brain, spinal cord and thorax in which postoperative hemorrhage may be hazardous, and (4) granulating wounds or conditions requiring drainage from the gastrointestinal tract. Again, prophylactic use of Dicoumarol is hardly feasible in patients confined to bed for prolonged periods of time because of cardiac, pulmonary or other serious medical conditions. In addition, because the individual reaction to Dicoumarol is unpredictable, this anticoagulant should not be given in large doses unless facilities are available for accurate determinations of the prothrombin level. Dicoumarol is easier to give than heparin; it is less expensive and the effect lasts longer. Complications from hemorrhage are more frequent than with the use of heparin, according to reports from the literature. Just as with heparin, thrombo-embolism may recur after discontinuation of the drug. All those who have used Dicoumarol have for it a healthy respect. Under strict control it has been a great boon, but without constant vigilance it can be a serious threat to the life of the patient.

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EDITORIALS

The Clinical Significance of Protein

The important role of protein nutrition in medicine has been stressed in abundant clinical and experimental reports. Although they are related to protein intake, we will not consider here the roles of fluid and electrolyte balance and vitamin intake, but rather of protein per se.

Proteins, whether derived from animal or vegetable sources, are designated as "complete" if they contain those amino acids which the body is unable to synthesize. Optimal nutrition, as far as protein intake is concerned, is usually considered to be one gram per kilogram of body weight per day for adults, and three to four times that amount for infants and children. All ingested protein is split by the pancreatic enzymes into polypeptides and ultimately into amino acids—in which form they enter the portal blood. The amino acids may be converted to carbohydrates, or may be used as building blocks for the formation of body or plasma proteins. The liver plays a dominant role in these processes. All nitrogen excreted by the kidneys is from either this ingested (or exogenous) protein, or the breakdown of body (or endogenous) protein. Nitrogen loss in the stools is highly constant in health. In disease protein may be lost in the urine, from the surface of burns, or areas of suppuration. An individual is in nitrogen balance only if his nitrogen (i.e., protein) intake is equal to the total nitrogen loss from all routes. If nitrogen loss exceeds the intake, the inference is inescapable that tissue proteins are being destroyed to meet the demands and the person is in "negative" nitrogen balance.

A clinical suspicion of protein deficiency may be obtained by scrutiny of the patient's dietary history, both as to protein and caloric content, for if the latter is inadequate body proteins are burned to furnish energy and loss of weight will result. If a decrease in plasma proteins is detected gross protein deficiency is present. In this

connection we should recall that Elman⁷ has calculated that in an adult of 70 kilograms for each gram per cent that plasma proteins decrease, a total body loss of fully one thousand grams has occurred.

Protein deficiency may result from inadequate intake (as in famine); inadequate absorption (as in chronic diarrhea or absence of pancreatic ferments); or inadequate utilization (as in cirrhosis of the liver). The heightened metabolism of fever or hyperthyroidism increases the need for protein as does the developing fetus in pregnant women. Excessive loss may be occasioned by the exudate of severe burns or infected wounds, or the albuminuria of nephrosis.

A few specific illustrations may make these generalities more vivid. Excessive urinary nitrogen loss representing a negative balance of 50-150 gm. of body protein per day may follow with fractures,⁵ burns,⁸ or relatively simple surgical procedures. Gastrointestinal surgery results in an added strain on protein stores because of the patient's inability to assimilate food. Wounds heal less rapidly when hypoproteinemia is thus allowed to develop⁹ and this lack of satisfactory repair likewise involves, of course, internal suture lines such as at the site of gastrointestinal anastomoses.

In non-surgical realms, the anemia of pregnancy is frequently accentuated by protein lack,² hypoproteinemia is present in a major portion of patients with severe thyrotoxicosis¹ and in patients with cirrhosis of the liver. Peptic ulcers are reported to be more readily healed by feedings of a protein digest, rather than the traditional Sippy regime.⁴ Here, however, we should recall that many other factors are present in the complicated ulcer problem. In stenosing duodenal ulcer, with associated anorexia or frank vomiting, plasma proteins are soon distinctly lowered. The prompt utilization of small frequent feed-

ings of a protein digest, may correct the hypoproteinemia and hence tend to relieve the element of edema which is present at the scarred pylorus.

Whether an oral or parenteral protein is given will obviously depend on the nature of the disease, the magnitude of the deficiency, and the urgency of promptly meeting the protein deficit. The amino acids now available for protein therapy are derived from either the enzymatic or acid hydrolysis of casein, lactalbumins, or pancreas. Tryptophane is added to the products obtained by acid hydrolysis to render them complete. The oral preparations are palatable and the parenteral solutions so purified that reactions from their intravenous use is infrequent. The more concentrated oral products range in protein content from 70 per cent to 90 per cent. In general, when a case demands sustained parenteral glucose for nutrition it will prove desirable to give 5 per cent hydrolysates intravenously as well. In patients with vomiting, pronounced diarrhea, or enteric fistulae, parenteral amino acid therapy will be necessary. However, unless pain, toxemia or anorexia prevent an adequate intake, oral therapy will suffice in most all other instances. As much as 300 gm. of protein may be taken by mouth and assimilated readily. These oral preparations are fully acceptable to the patient in milk, fruit juices, or soup and serve as ideal supplements to the usual "high protein" hospital diet.

Plasma may be administered in protein deficiency, but its major use in connection with shock is not pertinent to this discussion. However, it should be re-emphasized that mere protein therapy must be complemented by full attention to other nutritional needs.

The integrity of the liver is paramount in the ultimate utilization of proteins no matter by what route they are administered. Thus in severe hepatic cirrhosis high protein diets usually fail

to significantly elevate the plasma level. Conversely, the liver is more prone to be damaged by poisons, as chloroform,⁶ when deficient in protein.

Many further points of clinical interest will surely be forthcoming in this field. One deserving mention is the work of Cannon³ which indicates that antibody formation is less active in persistent protein deficiency. The demonstration of the inter-relationship of these many facets of protein nutrition will continue to be an exciting and important sphere of clinical and experimental investigation.

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Penicillin Treatment of Resistant Subacute Bacterial Endocarditis

Subacute bacterial endocarditis caused by non-hemolytic streptococci of various types has been a uniformly fatal disease. Recent investigation has demonstrated that the infectious process can be eradicated in nearly all cases of this disease if penicillin is administered in sufficient amounts and for an adequate length of time.^{1,2,7}

It is now generally agreed that uninterrupted treatment for not less than four and preferably for six to eight weeks is necessary if optimum results are to be obtained.^{1,6} Penicillin may be administered in such cases continuously by the intravenous or intramuscular route.⁵ Equally and, perhaps, more satisfactory clinical results are obtained if the drug is injected intramuscularly at three-hour intervals.⁴ This technique is much more simple and usually preferred by the patient.

The amount of penicillin which must be given

during each 24-hour period is less clearly defined. In general, there is a rough correlation between the concentration of penicillin necessary for the complete inhibition of the infectious agent *in vitro* and the required daily dose. The streptococci isolated from the majority of cases of subacute bacterial endocarditis are inhibited by 0.1 unit of penicillin per ml.³ Under these circumstances the daily administration of 300,000 units of penicillin will usually be adequate for the elimination of the infection.¹

If the infecting streptococcus is more resistant larger amounts of penicillin must be used. No definite recommendations may be made at this time as to the minimum dosage which will be effective with organisms of increasing degrees of penicillin resistance. Each case must be managed individually. The initial daily dose should be 500,-

000 to 1,000,000 units. The dosage should be increased progressively in increments of approximately 1,000,000 units per day until the blood cultures are persistently sterile and all clinical signs of activity have disappeared. Such a regime will be followed by bacteriological cures in nearly all patients, but enormous quantities of penicillin may be required. Thus 5,000,000 to 20,000,000 units of penicillin per day have been administered⁶ and even larger dosage will certainly be necessary in certain cases.

The fact that a number of patients suffering from subacute bacterial endocarditis caused by moderately penicillin resistant nonhemolytic streptococci have recovered following the utilization of massive doses of penicillin when previous regimes employing smaller amounts had failed demonstrates that no person suffering from this disease may be regarded, on *a priori* grounds, as unsuitable for antibacterial therapy. On the contrary, the evidence suggests that adequate treatment will be followed by eradication of the infection in nearly every case.

A special and nearly unique problem has been presented to the medical profession since one to five thousand dollars or more may be required to purchase penicillin at wholesale prices for the cure of subacute bacterial endocarditis caused by resistant organisms. These costs are frequently too great to be borne by the individual patient or by the funds at present available for the purpose in clinic and free hospitals. A purely economic

barrier may, therefore, stand between the sick individual and the utilization of adequate therapy which may be expected to lead to recovery.

Suitable action on the part of the medical profession is imperatively required in order that funds may be made available for the treatment of these difficult cases of subacute bacterial endocarditis.

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New Industrial Accident Fee Schedule

Through the prolonged and painstaking efforts of a special committee of the California Medical Association, the Industrial Accident Commission has recently adopted a new and complete fee schedule. It became effective November 1, and copies have been sent to all members of C.M.A. The schedule provides an increase of approximately 25 per cent over the old schedule (or of approximately 9 per cent over the existing temporary one which consists of the old schedule plus a 15 per cent surcharge.)

It is anticipated that some insurance companies may attempt to circumvent the new schedule by making private contracts with individual physicians. Your Association believes that the new schedule, especially in view of current inflation, is reasonable, and will permit all properly conducted insurance companies to continue to make a fair

profit on their projects. Therefore, your Association urges each member to "stand by his guns" and adhere to the schedule as printed. In this manner, fair medical fees will be obtainable for competent work, and the tendency to maintain a high quality of work will be encouraged.

Some county societies may well decide to request members who arrange private contracts for industrial work to submit copies of those contracts to their Committees on Professional Conduct for review. This is a matter for decision by each individual county unit.

The new schedule, like all fee schedules, is not believed to be a perfect document; it is and should be subject to periodic review and constructive readjustment. Your suggestions to the Fee Schedule Committee of your county or state association will be respectfully received in this connection.



Clinical-Pathological Conference*

This 37-year-old white, American housewife entered Lane Hospital 11/10/42 with complaint of swollen ankles.

Present Illness: At about age 21, patient had a "cold" followed by pain in the flanks. Similar episodes recurred yearly or more often since that time. She became pregnant soon after onset of her illness and carried the baby to term although there was rather persistent vomiting and albuminuria throughout the pregnancy. She was under medical care for some time afterward. Appendectomy was done the following year and diagnosis of chronic salpingitis and retroverted uterus was made. About four years later (1933) cystoscopy and urograms were done to investigate pyuria. Pus was obtained from both ureters, but the urinary tract films were negative. Guinea pigs inoculated with urine failed to develop tuberculosis. In 1941, at the age of 36, hypertension was discovered; excessive menstrual flow developed and lasted for a year until hysterectomy was done. She became very weak and in the summer of 1942, began to suffer dyspnea even without exertion. Two months before admission, she began to have an unproductive cough and developed diarrhea and vomiting. Puffiness of the face, swelling of the abdomen and blurring of vision rapidly followed.

Past History: Tonsillitis at age 12 or 13 followed by tonsillectomy.

Physical Examination: T 37°, P 90, R 24, BP 192/110. Pale, dyspneic, tired and old-looking. Ocular fundi showed edematous discs and retinæ with large exudates and arterial narrowing. There were basilar rales and diminution of breath sounds. The heart was enlarged to left, and the sounds were regular and forceful. A slightly tender liver edge was felt just below the costal margin. There was slight dependent edema. The venous pressure was 190 mm. and the circulation time (arm—tongue) 22 sec.

Laboratory: RBC 2.77 M, Hgb. 46 per cent, WBC 4,500 (P 82, L 16, M 1). Packed cell volume 24 per cent, Erythrocyte sedimentation rate 20 mm. Blood Wassermann negative. Plasma protein 6.4 gm. per cent. Timed urine (24 hrs.): sp. gr. 1.011, protein 1.1 gm., casts 600,000 (300,000 hyaline with fat droplets), WBC and epith. 159 M, RBC 6 M. Blood Urea 283 mg. per cent, creatinine 10.6 mg. per cent. *Electrocardiogram:* Left axis deviation and abnormal T waves. *X-rays:* Chest = enlarged heart, pulmonary congestion, left pleural fluid. Urinary tract = four small renal calculi on left, no definite enlargement of left kidney, right not visualized.

Course: The patient was digitalized and put on 40 gm. protein diet. Multiple small transfusions were given for about a month. There was a

slight improvement in symptoms and the venous pressure fell gradually to 125 mm. and circulation time to 15 sec. The fluid in the chest increased though and the blood urea did not fall below 204 mg. per cent. The anemia progressed. Thereafter, the urea again rose, finally to 345 mg. per cent, and the patient died in coma 1/19/43 about two months after entry.

DR. ARTHUR SELZER*: This 37-year-old woman presented evidence of cardiac and renal failure during her final illness. She gave a history of severe exertional dyspnea and dyspnea at rest, and had basilar rales, a tender, enlarged liver and anasarca as evidence of failure of both the left and right ventricle. This was confirmed by x-ray signs of pulmonary congestion, by prolonged circulation time and by increased venous pressure. In this case, where heart disease is not the only condition present, where in fact it appears the less important of the two conditions as it will be pointed out later, it is necessary to elaborate the presence of cardiac insufficiency more fully and emphasize the value of objective measurements. It is too often that we see the diagnosis of cardiac failure made without sufficient evidence, where symptoms and signs of it are actually due to something else, and occasionally the proper perspective of such a case is lost due to this misdiagnosis. It is well to remember that dyspnea may be due to intrapulmonary disease, or to severe anemia, and heavy breathing may be due to chemical stimulation of the center from diabetic acidosis or in terminal Bright's disease. Edema of the lower extremities is more often non-cardiac than cardiac and may be due to a number of causes, local, or general.

Applying all caution due to cases of renal failure, one is confident that this patient actually had heart failure by the appearance of the chest x-ray and the results of circulation time and venous pressure measurements. The question of structural etiological diagnosis of the cardiac lesion appears simple, as hypertension is the obvious factor. One may mention, in passing, other common types of heart disease, coronary heart disease occurring prematurely in hypertensives, rheumatic, congenital and luetic diseases, but there is nothing in this abstract to compel one to consider any of these conditions more seriously, especially in the absence of diagnosable valvular deformity, and with an electrocardiogram and x-ray apparently bearing out left ventricular strain and hypertrophy. It is of interest that digitalization of the patient resulted in improvement as recorded by objective measurements. One may guess that cardiac failure was a secondary factor in this patient's course for the patient died obviously a renal and not a cardiac death.

* Taken from the Clinical-Pathological Conference, San Francisco County Hospital, October 1, 1946.

* Clinical instructor in Medicine, Stanford University School of Medicine.

Coexistence of cardiac and renal failure is probably not as common as is generally believed. Renal insufficiency may imitate signs of cardiac failure, as it was pointed out, but it may also precipitate failure of a heart damaged by hypertension. Cardiac failure in this patient was due to this cause, and it is probable that the additional factor of the associated anemia, and possibly also due to changes in the composition of blood electrolytes were important factors. On the other hand circulatory changes associated with heart failure often cause transient nitrogen retention, but may also precipitate true renal insufficiency. It is very important to distinguish in this combination the primary and secondary factors from the prognostic standpoint, and in early cases from the therapeutic standpoint.

This patient's renal insufficiency is evidenced by the persistently high blood urea and correspondingly high level of blood creatinine. One would like to have had determinations of calcium and phosphorus, as their reversed ratio confirms long-standing uremia and associated hyperplasia of the parathyroids. The diagnosis of renal disease is based on information gathered from the following procedures: history of previous renal disease; physical examination, examination of the urine; examination of the blood for retention of waste products; testing of the excretory function of the kidneys; visualization of the kidneys and urinary passages by radiography; and finally, by the presence or absence of hypertension.

The relationship of renal disease to hypertension is a subject where a great deal of confusion still exists. The initial enthusiasm which followed the experimental production of hypertension by clamping of the renal artery by Goldblatt has greatly subsided. It is generally accepted that the Goldblatt mechanism plays little part in essential, primary hypertension, which is the most common form of hypertension, for there is convincing evidence that hypertension may exist a long time with a normal renal blood flow and without structural changes in renal blood vessels, so that renal ischemia and vascular sclerosis are presumed to be the results and not the cause of hypertension in this group of cases. Hypertension may, however, develop secondarily to renal disease by a mechanism which may or may not be related to renal ischemia. Such a situation exists in the majority, though not in all forms of severe kidney disease, and the relationship is shown not only by the time of development of hypertension in renal disease but also by an occasional cure of hypertension after the removal of a diseased kidney.

In this patient, the association of renal disease and of severe hypertension—probably more severe than the blood pressure readings indicate, in view of severe hypertension retinopathy—suggest either primary hypertension in the malignant phase or the types of kidney diseases associated with hypertension, namely glomerulonephritis, pyelonephritis, polycystic kidneys, and periarter-

itis nodosa (and related vascular conditions). Other types of renal disease: tumors, tuberculosis, toxic nephrosis, amyloidosis, need not be discussed here for they seldom cause hypertension.

Essential hypertension is unlikely because of the recent onset of high blood pressure in the presence of a long history of renal disease and by the relatively low diastolic pressure, which usually persists even in failure. Glomerulonephritis cannot be completely ruled out, for it is known to exist in some cases in combination with urinary tract infection, but is not substantiated by any points in the patient's history nor by a pathognomonic urinary sediment. Polycystic kidneys, though compatible with intermittent kidney infection and late development of hypertension, are unlikely in the presence of a normal x-ray shadow of the kidneys and without palpable masses. Periarteritis nodosa may account for some odd clinical pictures but is not diagnosable unless a more distinctive clinical pattern is present.

Pyelonephritis is the one diagnosis which seems to fit best of all as the basis of this patient's course and terminal renal insufficiency. The history reveals repeated attacks of urinary tract infection since the age of 21 and a statement of the patient that pus was found in the urine recovered from the ureters. Granted that the urinary sediment is of little aid in diagnosis in the presence of uremia, the predominance of white and epithelial cells over casts in a quantitative study of timed urine favors somewhat pyelonephritis. Radiography shows shadows suggestive of renal calculi, but unfortunately no contrast visualization of the urinary tract was done so that there is no information available as to the renal pelvis, nor can one know about the excretory status of the right kidney, which did not visualize in the ordinary film. If this last detail could be confirmed by a more reliable method, one could speculate about the possibility of a congenital malformation of the kidneys which so often is the basis of later infection. There is nothing definite in this abstract to favor such a possibility, especially since the patient made a statement that her kidney x-rays were normal ten years before her present illness. One can guess therefore that this patient had a long-standing urinary tract infection with repeated acute exacerbations, with extension and destruction of the kidney parenchyma and secondary, late hypertension resulting in cardiac hypertrophy and strain. The eventual outcome of this process was renal failure with uremia. Cardiac failure was secondary and of relatively less importance.

DR. DAVID A. WOOD*: Dr. Selzer has presented a most clear clinical analysis of this case which is one of hypertension occurring as a sequel to an old bilateral pyelonephritis. Death was most probably on a uremic basis rather than that of cardiac failure. The parathyroid glands were considerably enlarged as a result of second-

* Associate Professor of Pathology, Stanford University School of Medicine.

ary hyperplasia, and one contained a small adenoma. Of interest was the presence of generalized arteriosclerosis which was unusually severe considering the fact that the patient was only 37 years of age. Excessive lipid deposition in the involved vessels as well as the presence of a collection of "xanthoma cells" in the wall of an artery in the spleen suggested the possibility of a concurrent generalized disturbance in lipid metabolism.

The autopsy revealed a marked pitting edema of both lower extremities which extended to the knees. Large amounts of clear fluid were present in the serous membrane cavities. In the peritoneal cavity 800 cc. were found; in the left pleural space, 800 cc., and in the right, 700 cc. Present in the pericardial sac were 500 cc. of thin fluid which was slightly blood tinged, and bounded by slightly roughened hyperemic surfaces.

Both kidneys were markedly shrunk with slightly thickened adherent capsules. They weighed 60 grams each. Their surfaces were irregular, scarred and pitted. Some of the scars were flat and depressed. Small, intervening cortical cysts were scattered throughout and measured up to a maximum of 0.5 cm. except for one cyst in the right kidney which measured 1.5 cm. in width. Upon cut section the cortex of each kidney was found to be irregularly thin. The pelvis of each kidney appeared large and the calyces dilated. This was more apparent than real, however, due to the marked loss of renal substance. No obstruction or calculus was found in either pelvis or ureter. (The autopsy failed to account for the four calcified shadows demonstrated radiologically in the left flank.) Except for the right renal pelvis the lining mucosa was pale and intact. The mucosa of the right pelvis revealed hyperemic areas and several white flat plaques. Several similar white plaques were found in the mucosa of the urinary bladder, whose lumen contained 50 cc. of blood tinged urine, and whose wall was quite thickened and rubbery. There were no aberrant renal arteries or unusual fibrous bands about the hilus of either kidney.

Careful inspection of each renal artery revealed no obstructing intimal plaques of significance.

The heart was enlarged at least one and a half times normal size and weighed 470 gm. Its pericardium showed a recent pericarditis which was interpreted as occurring most probably on an uremic basis. There was a moderate concentric hypertrophy of the left ventricle whose wall was thickened and measured up to a maximum of 1.5 cm. No scars were grossly evident in the myocardium. There was no thickening of the right ventricular wall and no dilatation of the chambers on the right side. The ostia of the coronary arteries were patent although their lumina were encroached upon considerably by atheromatous plaques in the intima of the aorta.

Both lungs were aerated and except for a small

amount of hypostatic edema revealed no significant findings. The left lung weighed 290 gm., and the right 440 gm. Chronic passive hyperemia was not grossly evident.

Two parathyroid glands had a combined weight of 0.3 gm. One contained an oval adenoma occupying about one-third of the total bulk of the gland.

Numerous atheromatous intimal plaques were distributed throughout the course of the aorta and into the branches of the celiac axis. As previously stated, the main renal arteries were relatively free of intimal thickening.

The abdominal viscera showed no chronic passive hyperemia. The liver weighed 1,440 gm., and the spleen 170 gm. Neither revealed grossly significant changes.

Bacteriologically, blood from the heart revealed no growth after seven days. Smears from the renal pelvis showed many gram-positive cocci in pairs or in short chains. In histological sections of the heart very occasional cocci were demonstrated in the pericardium.

Study of the microscopic sections confirmed the gross diagnosis of old, bilateral pyelonephritis. Sections of the kidneys showed numerous lymphocytes in the submucosa of the renal pelvis. Occasional small groups of lymphocytes were scattered throughout the cortex and medulla. This was associated with an irregular fibrous thickening of the interstitial tissue. Glomeruli were few in number and several of those which remained showed varying degrees of hyalinization. No crescents, or adhesions between the tufts and Bowman's capsules were found, such as one might have expected in a chronic hemorrhagic Bright's disease. Quite uniformly, the medium-sized arteries and arterioles showed extensive changes. The former showed much concentric fibroblastic intimal thickening, and the latter much subendothelial accumulation of homogenous hyaline-like material, resulting in marked narrowing of the respective lumina. Extensive but less severe arteriolar changes were also noted in the spleen, pancreas, and adrenal. One artery in the spleen showed a subtotal obliteration of its lumen by loose intimal tissue containing many "xanthoma cells."

The parathyroid glands showed a marked hyperplasia of chief cells resulting in a compressed stroma and a compact structure. Occasional clumps of oxyphil cells remained, and in places there were occasional cells with water clear cytoplasm (wasserhelle cells). One gland contained an oval adenoma which consisted of chief cells whose nuclei were more deeply staining and whose cytoplasm was less abundant.

Sections of the heart showed a shaggy layer of fibrin covering the epicardium. Immediately beneath this a narrow sub-epicardial zone was infiltrated by moderate numbers of lymphocytes. Bacterial stains revealed occasional pairs of lancet shaped cocci and several clusters of small round cocci.

In summary, this is a case of old, bilateral pyelonephritis. It seems quite evident that the hypertension in this case occurred as a sequel to the pyelonephritis. The absence of atheromatous involvement of either main renal artery is worthy of note. Occasionally, the presence of a large intimal plaque in one of the renal arteries may possibly result in sufficient ischemia of the kidney as to result in the development of hypertension. There is no evidence of glomerulonephritis. It seems quite clear that pyelonephritis constitutes the essential lesion. Arteriolar lesions in other organs (pancreas, spleen, and adrenals) are most probably secondary to the hypertension. As was to have been expected in such a long standing case of pyelonephritis, the parathyroid glands showed a notable secondary hyperplasia. Normally, the upper limits of normal for the combined weight of all four parathyroid glands is not in excess of 150 mg.; yet, in this case the weight of only two glands was 300 mg. Whether the small adenoma is a part of this hyperplasia or represents a separate process is impossible to

determine. No bone changes of hyperparathyroidism were demonstrated.

The absence of significant chronic passive congestion in the lungs and viscera as well as the absence of notable dilatation of the heart suggests that heart failure did not constitute the principle cause of death. It is likely that the latter was most probably uremic. Not only were the values for blood urea high during the last two months of this patient's life, the last recorded determination being 345 mg. per cent, but a rather typical sero-fibrinous pericarditis was found.

Student: What is the significance of the pericarditis?

DR. WOOD: Terminally, uremia not uncommonly is associated with the development of fibrinous pericarditis. Usually, not so much fluid is present as was found in this case. Ordinarily, it is a "sterile" pericarditis, inasmuch as the pathologist is usually unable to demonstrate organisms. The fundamental reason for its occurrence with uremia is not well understood.

CHILDREN BORN WITH SYPHILIS RESPOND WELL TO PENICILLIN TREATMENT

In a study of 61 children, two Atlanta physicians have found that penicillin is effective in the treatment of congenital syphilis.

Mrs. Joseph Yampolsky and Albert Heyman, who are from the Department of Pediatrics and Medicine of Grady Memorial Hospital and Emory University School of Medicine in Atlanta, used penicillin to treat the 61 syphilitic children, according to the October 19 issue of *The Journal of the American Medical Association*.

Thirty-two of the 61 children had simple infantile congenital syphilis. Twenty-three of the 32 responded satisfactorily under the penicillin treatment. "All 23 are clinically well, have normal spinal fluids and exhibit no clinical evidence of the disease," the authors say.

While three of the patients died, the authors believe that the fatalities were in no way related to the treatment. Two of the deaths "apparently resulted from an overwhelming syphilitic infection in premature and malnourished infants, while the third fatality remains unexplained."

In discussing the remaining 29 patients, the Atlanta doctors say that seven were suffering from acquired

primary and secondary syphilis, while the others were treated for late forms of congenital syphilis.

In the seven cases of acquired syphilis, the doctors say the patients were treated with doses of penicillin comparable to those used in adults. "The syphilitic lesions healed promptly in every case and the spirochetes disappeared rapidly," *The Journal* article says, adding: "All of these children have been followed for at least six months."

"The results obtained with penicillin in the treatment of syphilis in children seem to depend on the nature and duration of the disease. Although penicillin appears to be effective in the treatment of infantile congenital syphilis and in early neurosyphilis, little or no response can be expected in the treatment of the late manifestations of this disease."

Mrs. Yampolsky and Heyman say that while the optimum dosage of penicillin cannot be determined in such a small series of cases, "we believe that a total dose of penicillin of 100,000 units per kilogram of body weight is effective in the treatment of the majority of these cases."



CLINICAL CONFERENCE

Macrocytic Anemia With Edema

FROM THE COLLEGE OF MEDICAL EVANGELISTS, LOS ANGELES

DR. OLOV A. BLOMQUIST*: The patient presented today is interesting both from the diagnostic and therapeutic viewpoints. She is a 58-year-old white housewife who first entered the White Memorial Hospital on July 5, 1940. At that time she complained of swelling of the hands, legs and feet; orthopnea, cough, and vomiting spells. These symptoms had been present for two months. Difficulty in walking due to weakness, and numbness of the feet had been present for three weeks.

Two months before admission she first noted swelling of her hands and legs which became steadily worse until it involved the entire legs and thighs. At the same time oliguria and generalized pruritis developed. Dyspnea on slight exertion, a non-productive cough, palpitation, throbbing in her head, nausea and vomiting had also been present for two months. The nausea and vomiting occurred irregularly and were not related to meals but did result in a marked decrease in food intake. Friends told her that she had begun to look very pale two months before admission.

Physical examination revealed a 52-year-old white female who was obese, very pale and who presented generalized edema which was most marked in the dependent portions of the body, but which was also present over the arms and the shoulders. The temperature was 36.7°, pulse 88 per minute, respiration 22 per minute, and blood pressure 125/65 mm. Hg. The sclerae showed an icteric tinge but the eyes were otherwise normal. The ears, nose, and mouth were normal. The tongue was not atrophic or beefy. There was marked pulsation of the deep jugular veins. The apex of the heart was 12 cm. from the mid-sternal line in the left fifth intercostal space; the rhythm was regular; P₂ was accentuated and reduplicated; a blowing systolic murmur was heard over the entire precordium, best at the apex. The lungs were normal on physical examination. Due to the marked edema examination of the abdomen was difficult but there was fullness in the right upper quadrant suggestive of an enlarged liver. The legs and thighs were markedly edematous.

On admission the urine showed a specific gravity of 1.014 and a trace of albumin but was otherwise normal. Hematologic examination showed 1,000,000 erythrocytes per cubic mm., 4.2 gm. hemoglobin (25 per cent of 17 gm.), color index 1.25, 4,150 leucocytes per cubic mm., polymorphonuclears 68 per cent, eosinophiles 4 per cent and lymphocytes 28 per cent. There was anisocytosis 3 plus, poikilocytosis 2 plus and poly-

chromatophilia 2 plus. The platelet count was 36,000 per cubic mm. The reticulocyte count was 1.5 per cent. Numerous Howell-Jolly bodies were present and a few normoblasts were seen. Sternal marrow showed 5 per cent megaloblasts. Blood Wassermann was negative. Serum albumin was 3.6 gm. and globulin 1.5 gm. per 100 cc. of serum. The icterus index was 13. Urea clearance was 88 per cent of normal in the first hour and 71 per cent of normal in the second hour. Fractional gastric analysis with histamine revealed no free hydrochloric acid.

The electrocardiogram showed low voltage in the three standard leads with a maximum QRS deflection of 0.5 mv.

An orthocardiogram revealed generalized cardiac enlargement; both ventricles, both atria and the pulmonary conus were prominent. The cardiothoracic ratio was 17.5/27. There was considerable hilar congestion and a small amount of fluid at both bases of the lungs.

Gastrointestinal x-ray series was entirely normal.

The patient was placed on a high protein, low salt (2 gm. daily) diet. She was given two cc. of liver extract intramuscularly daily (approximately 30 u. daily, but in 1940 liver extract was not standardized by units so the unitage is an approximate figure). She was given 500 cc. of whole blood. All other treatment was withheld, except for general nursing care and simple sedation.

The reticulocyte response was 2.6 per cent on July 21, 1940, 9.3 per cent on July 23, 15 per cent on July 24, and 6 per cent on July 28.

On July 28, 1940 the blood showed 2,990,000 erythrocytes per cubic mm., hemoglobin 11 gm. (63 per cent of 17 gm.) and the color index was 1.1. The total leucocyte count was 5,650 per cubic mm. and the differential count was about the same as on admission.

By July 18 (approximately two weeks after admission) she was feeling a little better and her orthopnea and cough were less annoying. By July 21 the urinary output exceeded the fluid intake and this continued throughout her hospital stay. The edema decreased slowly but steadily until she went home on August 25, 1940, with no clinical evidence of edema.

At the time of discharge her blood showed 4,270,000 erythrocytes per cubic mm., hemoglobin 14.2 gm., color index .97, total leucocyte count 5,700 per cubic mm. with 53 per cent polymorphonuclears, 7 per cent eosinophiles, 32 per cent lymphocytes and 8 per cent monocytes. The cardio-thoracic index was 13.4/27. The voltage of the QRS complexes on the electrocardio-

* Assistant Clinical Professor of Medicine.

gram showed a marked increase over the previous tracing to 1 millivolt or a little more. The lungs were clear and free pleural fluid had disappeared.

This patient has been followed as an outpatient for the past six years. Since her discharge from the hospital she has continued to take liver extract regularly and has remained well ever since. She has had no symptoms of cardio-vascular disease, no edema, no anemia and no gastrointestinal distress.

DR. RAYMOND M. HILL**: In considering this problem we must answer two questions. What is the mechanism of the anasarca? What type of anemia is this?

Edema of this extent may be due either to disturbance of the extra cellular fluid osmotic relationships, increase in the hydrostatic venous pressure, or a combination of the two.

Associated contributory factors in the production of generalized edema include: (1) Capillary anoxia with increased permeability of the capillary bed, (2) decreased excretion of the sodium ion (as seen with excessive administration of desoxycorticosterones), or (3) increased dietary intake of the sodium ion as sodium chloride, or sodium bicarbonate.

There is considerable evidence in favor of disturbed extracellular fluid osmotic relationship in this case, although the cause of the decreased plasma proteins which were reported as 4.7 and 5.0 grams per 100 cc. of plasma, is not too evident. She did not have enough albuminuria to produce the decrease in plasma proteins. There is insufficient evidence to say that the decreased plasma protein is due to inadequate dietary protein intake.

I would hazard a guess that the decreased plasma proteins were due to a combination of decreased dietary protein intake, inadequate production of plasma proteins in the liver due to the severe anemia, loss of plasma into the extracellular tissues, and possibly a dilution factor associated with an increased plasma volume.

The normal osmotic pressure of blood is approximately 28 mm. Hg. One gram per cent of albumin increases the osmotic pressure approximately 5.5 mm. Hg., and 1 gram per cent of globulin increases it 1.9 mm. Hg. Based on such figures this patient had a plasma osmotic pressure of 21 or 22 mm. Hg. Hence all of the edema could be explained on an osmotic basis.

The anemia, leukopenia, thrombocytopenia, increased color index, increased volume index, and the megaloblasts in the sternal marrow are characteristic of macrocytic anemia. It is more difficult to determine whether it is a nutritional macrocytic anemia, or pernicious anemia. Megaloblasts in the sternal marrow have been considered pathognomonic of pernicious anemia, but they are also found in nutritional macrocytic hyperchromic anemia. A diagnosis of pernicious anemia should not be made if there is free hydro-

chloric acid in the stomach contents, but achlorhydria does not exclude the diagnosis of nutritional macrocytic anemia.

The anemia, because of resulting capillary anoxia could have produced increased permeability of the capillary bed, and therefore edema. The increased capillary permeability would allow the albumin to escape from the plasma into the extracellular tissue spaces which would result in a decreased plasma protein level. I will not discuss the problem of the so-called heart of anemia.

I am debating whether to conclude that she had nutritional disease associated with hypoproteinemia, macrocytic hyperchromic anemia, vitamin B deficiency and congestive heart failure, or pernicious anemia with congestive heart failure and peripheral neuritis. The dramatic clinical response to liver extract, in my opinion, establishes the diagnosis of pernicious anemia with congestive heart failure.

DR. HAROLD J. HOXIE†: Generalized edema that is not of inflammatory or allergic origin has a tendency to be more in the dependent parts, regardless of the principal factors in causing the edema. Inflammatory edemas such as that of glomerular nephritis are determined by passage of sufficient protein through abnormally permeable capillaries so that water is held in the tissues, usually the looser tissues, in defiance of gravity. In practically all other types of general edema the hydrostatic pressure within the blood vessels is enough of a factor so that the edema is affected by dependency. This effect is more or less proportional to the importance of the intravascular hydrostatic pressure factor in the edema.

It is rare to find a patient with general edema in whom the edema can be attributed to disturbance of only one of factors that control interchange of body fluid between capillaries and tissue space. This patient had several factors conducive to edema. Distended veins in the neck indicate increased pressure transmitted back to the capillaries. Arteriolar dilatation as a part of the compensation for severe anemia tends to expose the capillaries to more of the pressure originating in cardiac systole. Both these factors tend to increase the filtering pressure in the capillaries. The tissue pressure outside the vessels resisting edema formation may have been reduced by loss of flesh during three months of illness.

The reduction of both albumin and globulin in the serum is another factor conducive to edema. Both fractions of serum protein were reduced to about the same extent indicating dilution and lack of production to be the chief factors rather than the albuminuria. The low globulin value tends to eliminate portal cirrhosis as a cause of the anemia.

We sometimes are able to eliminate edema by treating one of the edema producing factors. We cannot conclude that this is the only causative factor because in most patients edema results from a summation of factors.

** Assistant Clinical Professor of Medicine.

† Assistant Professor of Medicine.

This patient's case illustrates the interdependence of the various bodily systems. The cardiovascular system, the kidneys, the adrenal cortex, the digestive system, the respiratory system all had their functions disturbed by failure of the hemopoietic system to produce enough red cells.

DR. WILLIAM PAUL THOMPSON*: It appears that there is sufficient evidence to support the contention that heart failure played a part in the genesis of the symptoms and physical findings. The heart was large, the venous pressure was elevated, and congestion was present in lungs, liver and subcutaneous tissues. The disappearance of these abnormalities with disappearance of the anemia establishes beyond reasonable doubt that this is an example of the so-called heart of anemia, one of the reversible forms of heart disease.

DR. WALTER E. MACPHERSON**: Surely this is a very interesting case. The fact that the patient is now well and free from symptoms is of primary importance to her and makes us feel good.

The discussion, however, has been most valuable in diverting our attention and thoughts to the underlying disturbances in physiology. The fact that the patient has a primary hyperchromic macrocytic anemia seems to be well supported.

* Associate Clinical Professor of Medicine.

** Professor of Medicine.

The clinician who supervised her treatment took special precautions to change her previous program in only one important respect, namely, the use of liver extract.

Therefore, it seems reasonable to conclude that the chief factor which was responsible for initiating the various disturbances in physiology which accounted for her findings and symptoms was the anemia.

In trying to reconstruct this picture one has a right to assume that there was sufficient anoxia to cause a moderate degree of heart failure, to cause an increase in capillary permeability, and to cause a moderate decrease in liver function, particularly in the formation of serum protein.

I agree with Dr. Hill that the fact that this is rather an unusual picture for this type of anemia strongly suggests an underlying nutritional deficiency which by itself was relatively benign. At any rate, it appears as though a vicious cycle, the component parts of which were moderate myocardial failure, increased capillary permeability, and decreased liver function, with each one contributing to the disturbed function of the other, could well explain the clinical picture which is presented. The fact that the elimination of the anemia was sufficient to break up this vicious cycle is of interest. From all reports which are now available, one assumes that the general physiology of the patient is reasonably well within normal limits.

MILLIONS WASTED ANNUALLY ON HOME REMEDIES FOR COLDS, GRIP

Outmoded self-treatment methods and commercial advertising are largely responsible for the waste of millions of dollars annually by people with colds, grip and influenza, according to Hobart A. Reimann, M.D., of Philadelphia.

Writing in the November 2 issue of *The Journal of the American Medical Association*, Dr. Reimann, of the Jefferson Medical College and Hospital, refers to many of the preventive and therapeutic measures in common use as "obsolete" and "illogical." He especially condemns the waste of the sulfonamide compounds and such antibiotics as penicillin which are ineffective for these viral infections.

Respiratory diseases are widely prevalent and "account for most of the home visits (32 per cent) and provide the second most common reason (15 per cent) for office visits to general practitioners," states the author. "The average person is said to suffer from one to four bouts each year, accounting for about 250 000 000 infections annually in the United States. Infections of the respiratory tract cause more loss of time from industry and from schools than all other diseases combined. They are rarely a direct cause of death, but they precede or incite many other serious infections [such as pneumonia or meningitis]."

Except for influenza vaccine there are no specific preventive procedures, and no specific treatment exists for any infection of the group. The most that can be done

for the patient is to relieve discomfort, to prevent complications without impeding the natural process of recovery and to minimize the spread of infection to others.

If aching and headache are present they are best controlled by warmth, rest in bed and the use of an analgesic. There is no need to change from the normal diet and fluid intake in the average infection. Rest, as for any other infectious condition, is the best treatment for it serves several purposes: (a) aids recuperation, (b) lessens complications, (c) prevents the spread of the disease to others and (d) keeps the patient from acquiring a more serious infection from contact with "carriers."

Good health alone is no insurance against colds. Dr. Reimann points out that "although excellent physical condition, peace of mind, adequate diet and pleasant weather supposedly furnish resistance, infections of the respiratory tract occur for no obvious reason in otherwise robust persons. However, certain circumstances known by common experience to lead to colds such as exposure to wet and cold, sudden chilling in drafts, volatile irritants, dust, fatigue and other excesses should be guarded against, or neutralized by rest, warmth and comfort. Reasonably comfortable temperature and humidity of air in rooms is desirable, but no evidence is available as yet of their specific value. Residence in a climate where colds are less frequent is recommended for those who are subject to frequent infections, if economic circumstances permit."

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NOTICES AND REPORTS

C.M.A. Radio Show Has Audience of 600,000

Every Saturday evening, from 9:15 to 9:30, more than 600,000 people in California tune in the California Medical Association radio program, "California Caravan," aired over 18 stations in the Mutual-Don Lee Broadcasting System. They not only hear a good show, but also hear about California Physicians' Service and the advantages of pre-paid medical care.

Inaugurated June 15 by The Council of C.M.A. as a new phase of California medicine's public relations program, "California Caravan" established its popularity with the vast radio audience within a month, according to Hoopering, the standard survey service of the radio industry.

The Hoopering of the C.M.A. program for July, 4.8, indicates an average audience of 635,000 listeners per show and is a better rating than that given many of the big-budget and big-name shows for that period.

Here are some comparative ratings compiled from the July telephone survey of radio audiences conducted by

C. E. Hooper, Inc., showing the relative standing of C.M.A.'s program:

"Can You Top That?".....	6.6
"Ford Program"	2.1
"Standard Hour"	8.6
"Orson Welles' Mercury Theater".....	3.7
Nash Kelvinator	4.3
"Theater of Romance" (Colgate).....	4.2
Fred Waring. (Jolson Wax).....	4.5
"CALIFORNIA CARAVAN," C.M.A. program...	4.8

The stimulus of C.M.A.'s public relations program in building California Physicians' Service—through newspaper and radio advertising, publicity and the campaign of "Voluntary Health Insurance Weeks," which has now covered 25 counties—is indicated by the fact that C.P.S. enrollment has doubled since January 1 of this year—and every person enrolled in a voluntary health system in California is building stronger the medical bulwark against COMPULSORY health insurance.

C.P.S.—Growth and Problems

Although a doubling of the enrollment of beneficiary members of California Physicians' Service in the first ten months of this year has been attended by a higher average cost per claim and a necessary increase in membership dues, an outstandingly hopeful development is seen in the type of group now being enrolled.

The board of trustees looks upon the recent enrollment of the members of the Merchants and Manufacturers Association in Southern California as indication that managerial, as well as employee groups, are giving recognition to the value of C.P.S. Moreover, it is felt that this trade association of some 1,500 business organizations offers a large potential of further new membership. The same is true of the Lettuce Growers' Association of Salinas Valley, which has recommended that C.P.S. be considered by all its members.

Among other large groups recently enrolled are the May Company of Los Angeles, Borden's Dairy, the San Bernardino Air Base and the Southern California Telephone Company. An interesting departure is the current enrollment of employees at Hunters' Point Naval Base.

Enrollment of members of chapters of the California State Grange has proceeded apace. To date over 10,000 people in 175 chapters have been enrolled under a surgical and hospital coverage plan which C.P.S. submitted last spring at the request of the State Grange.

Negotiations are still under way with the Standard Oil Company of California, which had requested a program of medical, surgical and hospital care for dependents of its employees. Due to unforeseen difficulties, enrollment there has not yet begun. The Southern Pacific Railroad and the Pacific Electric Company of Los Angeles are now studying proposals for care of dependents of their employees which C.P.S. submitted at their request.

Inevitably, increased membership has brought with it additional administrative problems for C.P.S. There has been a very heavy increase in utilization of service. The average cost per claim has risen from \$17 to \$24. Statistics show that groups in existence less than four months are accounting for 40 per cent of total claims. Groups with membership of a year or less are using 60 per cent of the total.

RATE INCREASE

As was reported at the May meeting of Administrative Members, in October, 1945, the total deficit was \$279,144.21. By May 1, 1946, this had been reduced to \$137,912.66. Due to the large number of surgical contracts which make up the beneficiary membership, C.P.S. experienced, during the summer months, a very heavy utilization of service. Because of this, reduction of the deficit has not been as rapid as was anticipated.

At the Board of Trustees meeting held August 11, 1946, the Board, upon advice from the administration, voted an increase of dues to beneficiary members in the amount of approximately 25 per cent. The increase is being put into effect as rapidly as possible.

The necessity for a rate boost is not out of line with the experience of other medical care plans throughout the nation—Blue Cross hospital plans among them—which have had to put increases into effect as costs have mounted in the general inflationary trend.

The number of beneficiary members, which had increased by 81,350 to a total of 208,192 during the 12 months preceding the annual meeting of C.P.S. Administrative Members held in May of this year, more recently has been rising at an accelerated rate. As of November 1, the total was 327,481, almost double the 170,000 on the books at the beginning of the year. The increased rate of growth is particularly gratifying to the trustees because it has been accomplished during a period when rapid turnover of employees in many industries and services has presented difficulties to enrollment.

VETERANS' PROGRAM

Membership figures of course do not include the beneficiaries under the C.P.S. arrangement with the Veterans' Administration for medical care of veterans of the armed forces. Reports from the field are that this program is running smoothly. An indication of the size of this program is contained in a recent figure showing that there are now 1,400,000 veterans in California. In August, \$175,694 of Veterans' Administration funds was earmarked to pay physicians for services to veterans, and there is a considerable increase with each succeeding month.

Beyond immediate aspects, the medical care plan for veterans is redounding in good will for C.P.S. Colonel J. C. Harding, Chief of the Veterans' Administration Out-Patient Department and assistant to General Paul R. Hawley in Washington, on a recent visit to California Physicians' Service offices in San Francisco said

that C.P.S. had the best such program in the United States. Further recognition of the California program came in the form of a visit from a member of the Wisconsin Veterans' Program, who was sent to study procedures under the plan in California. As a result the Wisconsin organization is modeling a veterans' program after the California plan.

EXPLANATION PROGRAM FOR PHYSICIANS

Expanding beneficiary membership and the growing use of the veterans' care contract have brought with them a need for a more active program of explanation for the physician members, who now number more than 7,500. To this end, the C.P.S. medical director and assistant medical director, together with representatives from the department of professional relations, have arranged speaking dates with all County Medical Societies to present information on the workings of both the Commercial and the Veterans' Programs. Response to the meetings held thus far has been excellent and demonstrative of interest by the profession as a whole. Question periods which are a part of the meetings have developed added information of value not only to member physicians but to the management of C.P.S. as well.

The growing volume of business has dictated expansion in the organization and additions to personnel of C.P.S. There are now 19 district offices, including one in Sacramento County, in addition to the Los Angeles and San Francisco general offices. C.P.S. now has 245 full-time employees, 72 of whom are employed jointly with Blue Cross in Southern California. The Veterans' Program alone now requires 58 employees.

In the expansion in membership—particularly in the character of recent enrollments—in the smooth operation of the Veterans' Program, and in the growing recognition accorded C.P.S., the management sees encouragement for an expanding program of medical care on a voluntary prepaid basis.

CHESTER L. COOLEY, M.D., *Secretary.*

Information for Authors, Participants in Symposia and Panel Discussants

1. All members taking part in such programs should have a manuscript ready for presentation to the Section Secretary. The manuscript does not need to be followed verbatim at the meeting itself, but must be available for consideration by the Editor of CALIFORNIA MEDICINE for publication in that Journal.

2. All manuscripts become the property of the California Medical Association until officially released, upon written request of the author, for publication elsewhere.

3. Members are reminded that each lantern slide takes approximately one minute for presentation and that no lantern slides should have more than about six lines of text on them. Lantern slides containing voluminous chart or statistical data are largely a waste of time. The interest of the audience is better held by succinct presentation of the principal points.

4. Authors must inform Section Secretaries in advance of any special equipment needed for presentation of papers, other than standard lantern slides (3¼" x 4" glass slides).

5. Extra time is not allowed for the presentation of slides, movies or other material, however remarkable, except by arrangement at least three months before the annual meeting.

6. Authors submitting pictures or charts for use with their articles when published are reminded of the rule limiting to \$15 the amount which CALIFORNIA MEDICINE

may spend for engravings to reproduce illustrations. (Fifteen dollars will buy approximately a half page of engravings for shaded drawings or photographs and three-quarters of a page of absolute black and white engravings.) When an author wishes to include more engravings than can be paid for by CALIFORNIA MEDICINE under the \$15 limitation, the usual practice is to bill him for the amount by which the cost of engravings exceeds the limit.

7. References listed at the end of manuscripts submitted for publication in CALIFORNIA MEDICINE should follow the style used in the Quarterly Cumulative Index Medicus—the author's name first, followed by the title of the article, then the name of the publication abbreviated as it is in the Cumulative Index, the volume number, page number, month of issue (with the day of the month if the journal listed is published oftener than monthly) and the year. Example: Fox, C. L., Jr.: Oral Sodium Lactate in Treatment of Burn Shock, J.A.M.A., 124:207 (Jan. 22), 1944.

When reference is made to a book, the order should be: Author's name, title of book, name and address of the publisher, and the year of publication.

Lists of references should be arranged alphabetically by author's name, so that the reader on seeing a name in the text may turn to the bibliography and find the full reference in the alphabetical listing.

Information for Section Secretaries

The following information is for the guidance of Section Officers in connection with Annual Meeting of the California Medical Association.

1. All papers read at the Annual Meeting must be ready for handing to the Section Secretary at that meeting.

2. Speakers should be urged to prepare a condensed version of their papers for "verbal" presentation (in addition to the regular copy for submission to the Section Secretary for the editor of CALIFORNIA MEDICINE.)

3. All papers must be preceded by an abstract not to exceed 50 words, mailed to the Association office, 450 Sutter Street, San Francisco, by February 1.

4. Papers should be designed for presentation in 15 minutes; the maximum time allowed is 20 minutes. The Section Chairmen should signal speakers at the end of 17 minutes, to indicate that only 3 minutes remains.

5. Discussions should ordinarily be limited to 5 minutes; no person may speak twice on a subject except by permission of the meeting; the authors' closing discussions are limited to 5 minutes.

6. Section Chairmen are requested to notify speakers when their time is reached.

7. Under special circumstances (distinguished authorities, specially invited discussants, members of symposia, etc.) a speaker or discussant may be allocated times longer than the above. This must be done by prearrangement, with the allotted time indicated in the program.

8. All papers read at the Annual Meeting are accepted on the condition that they are contributed solely to CALIFORNIA MEDICINE; members desiring to publish their papers elsewhere must make written application to the Editor.

9. A member may not present a paper in each of two succeeding years, or more than one paper at each session. Failure of a member to comply with these rules precludes acceptance of further papers for a period of two years.

10. Section Secretaries *must* inform the Committee on Scientific Work in advance of any special equipment needed for speakers, other than standard size lantern slide projector and screen.

In Memoriam

Conlan, Peter Timothy. Died at Los Angeles, July 15, 1946, age 75. Graduate of Creighton University School of Medicine, Omaha, Nebraska, 1898. Licensed in California in 1927. Doctor Conlan was a Retired Member of the Los Angeles County Medical Association, and of the California Medical Association.

✱

Gasteiger, Ernest Sipe. Died at Sawtelle, September 14, 1946, age 46. Graduate of Jefferson Medical College of Philadelphia, Pennsylvania, 1927. Licensed in California in 1928. Doctor Gasteiger was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✱

Joesting, Harold Carl. Died at Los Angeles, September 18, 1946, age 42. Graduate of the University of Minnesota Medical School, Minneapolis, Minnesota, 1929. Licensed in California in 1942. Doctor Joesting was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✱

Maroon, John Luther. Died at Santa Ana, October 9, 1946, age 72. Graduate of Vanderbilt University School of Medicine, Nashville, Tennessee, 1912. Licensed in California in 1917. Doctor Maroon was a member of the Orange County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Picard, William J. Died at Berkeley, September 30, 1946, age 59. Graduate of Albert-Ludwigs-Universität, Medizinische Fakultät, Freiburg, Baden, 1917. Licensed in California in 1939. Doctor Picard was a member of the Alameda County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✱

Schaefer, Anton Henry. Died at Berkeley, September 29, 1946, age 41. Graduate of Stanford University School of Medicine, Stanford University-San Francisco, 1941. Licensed in California in 1941. Doctor Schaeffer was a member of the Alameda County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✱

Swauger, Luella Stone. Died at Oakland, September 16, 1946, age 75. Graduate of California Eclectic Medical College, Los Angeles, 1892. Licensed in California in 1893. Doctor Swauger was a member of the Alameda County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✱

Claud E. Norris. Died August 31, 1946, age 67 years, of carcinoma of the lungs. He was a graduate of the St. Louis Medical School. In 1910 he connected with the Philippine Island health service and served in various parts of the islands, eventually becoming senior health officer there. In 1923 he returned to the United States and entered the Tulane University Medical School. He then took up private practice in Eureka, California. He leaves a wife, Sadie B. Norris, and a brother, Dr. Clarence O. Norris.



NEWS and NOTES

NATIONAL • STATE • COUNTY

ALAMEDA

Return of four Alameda County physicians from service in the armed forces to private practice is announced in the October issue of the Bulletin of the Alameda County Medical Association. They are **John Blum**, internal medicine, 2140 Shattuck Avenue, Berkeley; **Lynn Foree**, general practice and surgery, 379 30th Street, Oakland; **Harrel Lee Harrington**, urology, 379 30th Street, Oakland; **Henry S. Patton**, plastic and reconstruction surgery, 411 30th Street, Oakland.

COLUSA

The Colusa County Board of Supervisors has appointed **Dr. E. Sturgis Bramlett**, Colusa physician and surgeon, as county health officer for a term of one year. Dr. Bramlett will assist **Dr. J. E. Tillotson**, who remains as county physician and medical director of Colusa Memorial and Colusa County Hospitals. As County Health Officer, Dr. Bramlett succeeds **Dr. Charles F. Keith** of Williams, who resigned, effective October 1.

FRESNO

Dr. Samuel Ross, recently released from the Army with the rank of lieutenant-colonel, has resumed his practice in Fresno, with offices in the Fulton-Fresno building. Dr. Ross has just completed postgraduate work in clinical allergies in the graduate school of the University of Southern California.

LOS ANGELES

German physicians, cut off from medical advances in the western world for five years, will be **re-educated in modern techniques** in a program directed by **Dr. E. Ross Jenney** of Los Angeles, chief of the Public Health Branch of the Office of Military Government for Bavaria, the office announced. Dr. Jenney, formerly a colonel in the Army Medical Corps, was sent to Europe in 1944 where he was awarded a citation by King Haakon VII for distinguished services while with the public health division of the Allied Mission to Norway.

Having recently returned from military service, **Dr. Allan B. Wilkinson** has opened an office for the practice of general surgery at 136 North Central Avenue, Glendale.

Dr. Frank R. Anderson, physician and surgeon, has opened a new office at 71 North Baldwin, **Sierra Madre**. Dr. Anderson served with the United States Navy Medical Corps during the war. Before that he practiced medicine in San Jose for approximately 15 years.

Dr. Maxwell Andler, resident physician of Los Angeles General Hospital, has been elected president of the hospital's Interne Residents' Association. Other officers chosen are **Dr. John Armstrong**, vice-president; **Dr. John Zaro**, treasurer; **Dr. Laurel Weibel**, secretary. Dr. Andler succeeds **Dr. William Grube**.

Dr. Grover Kempf last month took over his new position as chief of the United States Public Health Service, with jurisdiction over incoming vessels and planes from San Luis Obispo to San Diego. Dr. Kempf

will make his headquarters at the Terminal Island quarantine station. He succeeds **Dr. R. H. Heterick**, 65, who retired after 38 years in the service.

RIVERSIDE

Dr. C. H. Baldwin, formerly of New Hampshire, is now associated with **Dr. Charles H. Peppers** and **Dr. W. P. Aiken** at 483 North Palm Canyon Drive, Palm Springs.

SACRAMENTO

At a testimonial dinner held recently at the Sutter Club in Sacramento, **Dr. Andrew M. Henderson** was honored on the occasion of his retirement as Sacramento Division surgeon for the Southern Pacific Company. The dinner was attended by Southern Pacific officials from San Francisco and Sacramento and a number of Sacramento physicians. Dr. Henderson joined the S.P. in 1893, left for further study in Europe and the East, and returned in 1906.

Governor Warren has announced the appointment of **Dr. William F. Quinn** of Los Angeles to the State Board of Medical Examiners for the term ending January 15, 1950. Dr. Quinn, a member of the department of surgery at the College of Medical Evangelists, succeeds **Dr. George Thomason**, whose term expired.

SAN DIEGO

Dr. S. J. McClendon, president of the California Medical Association, recently returned from Rio de Janeiro where he was invited to present a paper on Rheumatic Fever at the first Inter-American Medical Congress. At the conclusion of the meeting he was **elected to the board of directors** for the next congress, scheduled for 1948 in Mexico City. The congress was organized under auspices of the National Academy of Brazil, subsidized by the Brazilian Government, and sponsored by the United States Government, through its Inter-American Affairs Institute and the medical departments of the United States Army and Navy.

SAN FRANCISCO

Several San Francisco Bay Region doctors have been appointed **civilian consultants to the Secretary of War**. They will aid the Army in maintaining the highest standards of medical practice, according to Major General Norman T. Kirk, the Army Surgeon General. The appointments included: **Dr. John J. Sampson**, **Dr. William J. Kerr**, **Dr. Edward Campion**, **Dr. Karl W. Bowman**, **Dr. Alexander Simon**, **Dr. Charles D. Aring**, **Dr. Carleton Mathewson**, **Dr. Leonard B. Bernard**, **Dr. Frank W. Lusignan**, **Dr. Thomas E. Gibson**, **Dr. William A. Sumner**, **Dr. Eugene S. Hopp**, **Dr. Walter P. Work**, **Dr. Paul C. Samson**, **Dr. Frederick C. Cordes**, **Dr. Max Fine**.

Suggestion that planes be processed to prevent transfer of fleas, rats and other disease carriers in overseas air travel was made by **Dr. J. C. Geiger**, San Francisco public health director, before a recent meeting of the Pacific Association of Railway Surgeons. At the same time, he said, passengers should be examined for quarantine. A system for international controls, he added, was already being formu-

lated and international health bureaus could be in operation within two years.

Announcement of the appointment of **Dr. John Welch Brown** to the Professorship of Preventive Medicine and as Director of Student Health at the University of Wisconsin was made by Dr. Wm. S. Middleton, Dean of Medicine at that institution. Dr. Brown, whose appointment became effective November 1, 1946, received his M.D. degree from the **University of California** in 1935. He has served as Director of Clinical Laboratories, University of California Hospital, and as Assistant Professor of Medicine, University of California Medical School. He was on war leave from November, 1941, to December, 1945.

SAN JOAQUIN

Dr. Arthur Sonnenberg, who was formerly located at 48 East Ninth Street, Tracy, has moved to his new medical building at 49 East Tenth Street.

SANTA CLARA

Dr. Donald George Marquis, Stanford graduate of 1928 and assistant in neuro-anatomy at Stanford Medical School in 1929-30, was elected president of the American Psychological Association at the annual meeting of the organization in Philadelphia in September. Dr. Marquis, who was a fellow in medicine at Stanford in 1928-30, continued his studies at Yale University, where he subsequently held various posts in the department of psychology, becoming head of the school in 1941. Last year he went to the University of Michigan, where he is now chairman of the psychology department.

SONOMA

Dr. A. Morse Bowles, Santa Rosa physician and surgeon, who earlier this year was elected secretary of the general surgery section of the California Medical Association, has been elected ex-officio member of the scientific assembly to map the program for the 1947 convention of the Association to be held April 30 to May 3 at the Biltmore Hotel in Los Angeles. Included in the assembly are: Dr. L. Henry Garland, chairman, Dr. J. Homer Woolsey, Dr. Howard F. West, Dr. Clayton D. Mote, Dr. Howard O. Dennis and Dr. Bowles.

YOLO

Dr. R. D. Brundage, formerly of Nebraska, has taken over the practice of **Dr. W. D. Garcelon** in Esparto. Dr. Garcelon has moved to Sacramento.

At a recent meeting, Yolo County supervisors voted three to two against a proposal to open the new **Yolo General Hospital** to pay patients. Private physicians who attended the meeting sought the opening of the hospital immediately.

GENERAL NEWS

Doctors of medicine are needed for appointments on a full-time basis in the Las Vegas and San Bernardino offices of the Veterans' Administration to conduct physical examinations and render out-patient treatment.

A letter from the San Bernardino office of the Veterans' Administration describes the appointments:

"The doctor would be hired on a 40-hour week basis and the **salary range** would be determined by our Professional Standards Committee at Branch 12

in San Francisco. We desire very much and will make every effort to have the doctors appointed in the Department of Medicine and Surgery, Veterans' Administration, at the full grade for which the salary range is \$5,905.20 to \$6,802.00 per annum. However, if this is not approved by Branch 12, the appointment would likely be at the associate grade with the salary range of \$4,902.00 to \$5,905.20 per annum, in which case, the doctors would become eligible for promotion to full grade after six months of thoroughly satisfactory service."

The scientific exhibit at the Centennial Session of the **American Medical Association** to be held in Atlantic City, June 9 to 13, 1947, will include both the history of medicine during the past century and the latest developments of medical science.

Application blanks for space are now available. All applicants must fill out the regular form. Applications close January 13, 1947, after which the Committee on Scientific Exhibit will make its decision and notify the applicants.

Application blanks should be procured as soon as possible. They are available from The Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago, 10, Illinois.

The National Gastroenterological Association announces its annual **cash prize award contest** for 1947. One hundred dollars and a certificate of merit will be given for the best unpublished contribution on Gastroenterology or allied subjects. Certificates will also be awarded those physicians whose contributions are deemed worthy.

Contestants residing in the United States must be members of the American Medical Association. Those residing in foreign countries must be members of a similar organization in their own country. **The award is to be made** to the winner at the annual convention banquet of the Association in June of 1947. The Association reserves the exclusive right of publishing the winning contribution, and those receiving certificates of merit, in its Official Publication, "The Review of Gastroenterology." All entries for the 1947 prize should be limited to 5,000 words, be typewritten in English, prepared in manuscript form, submitted in five copies, accompanied by an entry letter, and must be received not later than April 1, 1947. They should be addressed to the National Gastroenterological Association, 1819 Broadway, New York 23, New York.

Two Californians have been appointed to the staff of the Associated Medical Care Plans, a national coordinating agency sponsored by the American Medical Association with Chicago headquarters. Frank E. Smith, Los Angeles, professional relations director for C.P.S. in Southern California, has been appointed director of the AMCP and William M. Bowman, executive director of C.P.S., will serve as vice-president of a twelve-man commission for the organization.

The appointments were made at the first annual meeting of the AMCP in Chicago last month.

Mr. Smith, with C.P.S. for two years, will establish residence in the headquarters city and Mr. Bowman will continue in his present capacity here.

A clearing house for more than 40 physicians' service organizations in 31 states, the AMCP has as its major objective the assurance of reciprocity among the services in these states and the eventual standardization of benefits.

INFORMATION

Purpose and Progress of the Hospital Survey in California

P. K. GILMAN, M.D.,* *San Francisco*

To attain the proper integration and extension of hospital services to meet the public need requires the complete support and cooperation of all groups in a body politic. That a beginning has been made is evidenced by an increasing realization that the hospital is a responsibility of the community and not of the individual. This communal interest demands equal participation and cooperation from those administering the institution, the physicians working in it, and the general public whose members will make use of the facility. The closer such cooperation is the better will the hospital fulfill its functions in the area as the distributing center for all types of medical service—preventive, diagnostic, therapeutic—and for the continuing education of doctors, dentists, nurses and the related professions.

The Commission on Hospital Care is a non-government public service committee, inaugurated by the American Hospital Association prior to the introduction of legislation in the Congress concerned with hospital construction, and is to study hospital service in the United States. This commission planned the state surveys and inventories of hospital facilities and is assisting state study groups by providing technical consultants and by tabulating data from questionnaires.

The public is becoming more hospital-minded and realizes that such institutions are a necessity. In our California hospitals the standards of service are high and, compared to other countries, we have more beds per population unit. However, the distribution of these facilities is by no means equal, many areas being under-supplied or with none.

How may these inequalities best be done away with? Surely not by uncoordinated and local planning controlled by local prejudices.

Broad planning on a state-wide basis is essential if facilities are to be made available to the people in all sections, and a necessary preliminary to such intelligent planning is a complete and detailed survey of existing institutions.

LEGISLATURE PROVIDES FOR SURVEY

Such a survey in California is being carried out by the State Department of Public Health and was made possible by legislation enacted at the 1946 special session of the legislature. This act provides for the making of a survey of the hospital and health center facilities and needs of the state and the development of a program for the construction of hospitals and health centers. There is also created a State Advisory Council on Hospital Facilities to consult with and advise the State Department of Public Health in carrying out the purposes of the act. Further, the State Department of Public Health is designated the sole agency to make application on behalf of this state for any federal funds, to accept such funds and provide for their expenditure to assist in future construction.

The Association of California Hospitals, through its officers and members, has cooperated whole-heartedly

with the Bureau of Hospital Surveys in the task of conducting a study of the 566 institutions giving active in-bed care in California, excluding federal and custodial facilities.

To date, 420 questionnaires have been returned. These will be sent to the office of the Commission on Hospital Care in Chicago and the data transferred to duplicate sets of punch cards. One set will be retained at headquarters to form part of the nation-wide picture, the other will be returned to the office of the State Department of Public Health where utilization of the information will enable the Bureau to estimate the adequacy of present facilities in the various parts of the state and then to evolve recommendations as to where and what types of institutions are necessary to make such facilities available to all the people. Such planning and resulting recommendations must, as stated above, be done and made on a state-wide basis and include recommendations for the extension of and addition to certain already existing facilities, as well as new construction in areas devoid of such conveniences.

STUDY TO AVOID COSTLY ERRORS

Before making definite recommendations as to site, size and type of facility, each community must be carefully studied if costly errors are to be avoided. Many factors will have to be considered thoroughly, such as population and population trends; relation to urban areas; income level and standards of living; distance, as influenced by topography, roads and means of transportation. These are among the many factors which decide the area to be served, the number of beds and the support that will be accorded the completed facility.

Today it is especially important that careful planning precede the erection of added facilities, as the cost of hospital service and construction has more than trebled during the past few years. Unless there is close cooperation between an economical hospital administration, a whole-hearted community and professional support, the cost of maintaining a hospital may prove prohibitive for those seeking care.

There are today two channels through which financing of non-profit hospital facilities may be augmented.

In California, Senate Bill 586 relates to the establishment, organization, government and powers of hospital districts. Under this act a petition signed by registered voters of the proposed district is the first step. The necessary signatures must equal in number at least 15 per cent of the number of votes cast in the proposed district for the office of governor at the last preceding election at which a governor was elected. Such petition is presented to the supervising authorities of the county, precincts are established and if a majority of the vote is favorable, within each county's supervisorial district, the supervising authority shall declare the district duly organized. Such districts may include incorporated or unincorporated territories or both, but may not include part of a county having a population in excess of 200,000. The number of written protests required to terminate the proceedings shall be a majority of the registered voters residing in the proposed district.

A hospital district is administered by a board of directors and may raise funds in one of three ways: annual

* Chief, Bureau of Hospital Surveys, Division of Preventive Medical Services, California State Department of Public Health.

assessment up to 20 cents for each hundred dollars of the assessed value of all taxable property within the district, special assessment if two-thirds of the voters of the district approve, or by bonds also calling for similar approval by the voters of the district.

The second means of aiding construction is by federal funds. The Hill-Burton Bill was recently enacted into law and proposes federal assistance to the states. The bill, as passed, appropriates funds on a matching basis (33 1/3 per cent federal funds to 66 2/3 per cent local) for the purpose of assisting the states in carrying out the survey of present facilities, determining the need for construction and developing a program for construction of such public and other nonprofit institutions as will furnish adequate hospital, clinic and similar service to all the people. Three million dollars was appropriated for this purpose.

In addition the act authorizes appropriation of \$75,000,-000 annually for a period of five years for the construction of public and other non-profit hospitals. If and when such monies become available California will stand to

receive approximately \$1,900,000 a year for the five-year period. This likewise will be available for 33 1/3 per cent of approved projects presenting reasonable assurance that adequate financial support will be available for their construction as well as maintenance and operation when completed.

Four walls and beds are but one factor in supplying hospital needs in a community. The quality of service offered the public and the availability of physicians determine the standards of the institution. While proper facilities go a long way toward attracting physicians, adequate income must be assured as well as opportunities for further study and the availability of advantages often lacking in isolated areas.

As a result of this survey, it is hoped a program will be evolved that will plan a system of hospitals and health centers each supplementing the others rather than competing. That this must ensue is obvious if proper standards are to be maintained and the type of service made available that will justify the existence of the institution.

Surplus Equipment Orders Exceed Supplies

California medical veterans awaiting or planning purchase of medical equipment from war surplus stocks are cautioned by the Los Angeles and San Francisco regional offices of the War Assets Administration that demand for popular, major items far exceeds supply.

Medical equipment set aside for sale to medical veterans has been apportioned regionally on the basis of veteran population of the 33 WAA regions in the United States, but quantities so far allocated are comparatively small and well below orders already on hand.

To permit a nation-wide inventory and a count of veterans by WAA regions, sales of medical equipment and supplies were "frozen" last June 10. The "freeze" was lifted August 23, and the new apportionment formula was placed in effect. Distribution is now in progress, with priority holders being notified as rapidly as items on their priority lists are allotted to the two California regional offices.

Under the new formula, the Los Angeles WAA office receives 4 per cent and the San Francisco offices 3 per cent of WAA stocks of medical equipment. A comparison of orders on hand, for which priorities have been issued, with the total of allocations for the two California regional offices under the new plan indicates the unbalanced demand-supply situation. For seven popular, major items of medical equipment those figures are:

Item	Los Angeles		San Francisco	
	Orders	Allotments to Sept. 23	Orders	Allotments to Sept. 23
Diathermy apparatus	192	0	35	0
Basal metabolism machines . . .	112	3	37	0
Electrocardiographs	136	0	28	0
Medical x-ray machines	265	38	50	18
Examining tables	162	21	75	2
Operating tables	83	25	35	94
Microscopes	249	4	204	0

The new apportionment policy corrects a confused and unbalanced condition created by handling of war surplus by seven federal agencies, before surplus sales were centralized in WAA on March 25, 1946. It also distributes to all WAA Regions, medical equipment formerly available only in those regions where warehouses of the medical sections of the services were located. As there were no such warehouses in California, very few

major items were available in this state until the new plan went into effect.

In spite of the demand-vs.-supply situation of major items, WAA invites medical veterans who have not obtained their priority certificates to file applications at their earliest convenience. Some items, particularly of supplies (as distinguished from equipment) will be in such quantity that most priority holders will be able to fill their needs. Such orders are filled in the numerical order of priority certificates, which means that the earlier the certificates are obtained the sooner the order is filled.

REFRESHER COURSE ON DIAGNOSIS OF NEOPLASTIC DISEASE

The California Cancer Commission, with the support of the California Division of the American Cancer Society, will present early next year a refresher course for the general physician under the supervision of the Tumor Board of the Los Angeles County General Hospital.

The course will be held from January 6-8, 1947, inclusively, with day and evening clinics. Hotel reservations are anticipated for members and wives who may desire to attend. Accommodations are planned for one hundred physicians.

The program is aimed to cover all the usual types and locations of cancer and allied diseases with special emphasis on information and procedure pertaining to diagnosis. The presentation will include tumor pathology, patient demonstrations whenever possible, and illustrated didactic lectures in all the specialties. Instructors are selected from the faculties of the University of Southern California Medical School and the College of Medical Evangelists according to their specialties in the connection with the Tumor Board of the Los Angeles County Hospital.

The California Division of the American Cancer Society, in sponsoring this program, has made the course available to any physician in Southern California without charge.

Since facilities limit the accommodations, reservations are now being accepted, and the Cancer Commission asks that interested physicians send their applications at once

to Edward M. Butt, M.D., 1930 Wilshire Boulevard, Los Angeles 5, California.

Schedule of the three-day refresher course follows:

MONDAY, JANUARY 6, 1947

- 9:00 a.m.—Welcome by the Cancer Commission—Dr. L. C. Kinney, Chairman.
 9:15 a.m.—The Opening of the Refresher Course—Dr. B. O. Raulston.
 9:30 a.m.—General Tumor Pathology—Dr. Ernest M. Hall.
 9:50 a.m.—Historical Development, The Cancer Problem—Dr. Ian Macdonald.
 10:30 a.m.—Experimental Cancer Research—Dr. H. Pearson.
 11:00 a.m.—Biochemistry of Growth—Dr. Duell.
 11:30 a.m.—Theories on the Nature of Cancer—Dr. Edward M. Butt.
 12:00 noon—Luncheon.
 Dr. H. P. Jacobson, Chairman
 1:00 p.m.—The Biopsy—Dr. John Budd.
 1:30 p.m.—New Patient Clinic—Dr. Leo M. Levi, Dr. Ian Macdonald.
 3:00 p.m.—Tumors of the Skin—Dr. Maximilian E. Obermeyer.
 5:00 p.m.—Pathology—Dr. Nelson P. Anderson.
 Surgery—Dr. William S. Kiskadden.
 Radiation—Dr. Horwitz.
 7:00 p.m.—Dinner.
 8:00 p.m.—Joint Meeting with Surgery Section of the Los Angeles County General Hospital—Dr. C. J. Berne, Chairman.
 Tumors of Thyroid—Dr. Isaac Y. Olch.
 Tumors of Stomach—Dr. E. J. Joergensen.
 Tumors of Colon—Dr. Phillip Cunnane.
 Tumors of Rectum—Dr. William H. Daniel.
 Roentgenographic Summary—Dr. Wilbur Bailey.

TUESDAY, JANUARY 7, 1947

Dr. Leroy Sherry, Chairman.

- 9:00 a.m.—Surgical Pathology—Dr. L. J. Tragerman.
 10:00 a.m.—Tumor Surgical Clinic—Dr. C. J. Berne.
 12:00 noon—Luncheon.
 1:00 p.m.—Oral, Pharyngeal, Laryngeal Tumors—Dr. J. McKensie Brown, Chairman.
 Larynx—Dr. Simon Jesberg.
 Pharynx—Dr. Stewart Harrison.
 Oral—Dr. George Sharp.
 3:00 p.m.—Chest Tumors—Dr. John Jones.
 4:00 p.m.—Brain and Cord Tumors—Dr. Cyril B. Courville, Dr. Rupert B. Raney.
 7:00 p.m.—Dinner.

8:00 p.m.—Genito-Urinary Tumors—Dr. Alvin G. Foord, Chairman.

Tumors of Bladder—Dr. J. J. Crane.
 Tumors of Prostate—Dr. H. C. Bumpus, Jr.
 Tumors of Kidney—Dr. Donald A. Char-nock.

9:00 p.m.—Bone Tumors—Dr. Paul McMasters.
 Benign Tumors—Dr. Keasby.

WEDNESDAY, JANUARY 8, 1947

- 9:00 a.m.—Tumor Board—Dr. H. P. Jacobson, Chairman.
 11:00 a.m.—The General Physician's Obligation to Neoplastic Disease—Dr. Wilbur Bailey.
 The Legal Responsibility of the General Practitioner to Neoplastic Disease—Dr. Louis J. Reagan.
 12:00 noon—Luncheon.
 1:00 p.m.—Gynecological Clinic—Dr. William E. Costolow, Chairman.
 Pathology—Dr. Curtis.
 Cancer of Cervix—Dr. Leo M. Levi.
 Cancer of Fundus—Dr. Henry N. Shaw.
 Tumors of Ovaries—Dr. Herman S. Hendrickson.
 3:00 p.m.—Leukemia—Dr. G. Carpenter.
 Hodgkin's Disease—Dr. George Sharp.
 7:00 p.m.—Dinner.
 8:00 p.m.—Breast Seminar—Dr. Lawrence Chaffin, Chairman.
 Pathology—Dr. Hugh A. Edmondson.
 Method of Biopsy—Dr. Alvin G. Foord.
 Benign Tumors—Dr. Ian Macdonald.
 Cancer
 The Radical Mastectomy—Dr. C. J. Berne.

INDUSTRIAL INJURY REPORTS MANDATORY

The California Labor Code in Section 6407 requires every physician or surgeon who attends an injured employee to file with the Division of Labor Statistics and Research of the California Department of Industrial Relations a complete report of injury. These reports are prepared on Form 21, "Physician's or Surgeon's Report of Injury" furnished by the Department.

The Division of Labor Statistics and Research is formulating a program to compile current and detailed statistics of industrial injuries for California for accident prevention purposes and all physicians and surgeons are urged by the Department to file *promptly* the reports required by law. Punctual filing of the reports will expedite payment of compensation benefits to injured workers and also payment of the doctor's fee, the Department says.

The Physician's or Surgeon's Report of Injury should be sent to the Division of Labor Statistics and Research, 507 Polk Street, San Francisco 2. Forms can be secured by writing to that address.



Letters to the Editor . . .

POST-ONCOLYTIC IMMUNITY

During studies on the extraction of substances from induced primary and transplanted rat sarcomata, Aptekman¹ and his associates of the Wistar Institute of Anatomy and Biology, and the Carnegie Institute, Washington, D. C., obtained an alcohol-soluble fraction that inhibited growth of tumor grafts and conferred immunity from further growth of homologous grafts in a large percentage of the treated rats.

All experiments were done on pure inbred strains of white rats. Sarcomas were produced in these rats by the injection of a carcinogenic agent into the right axilla. After the sarcomas had grown to a large size (50 x 25 x 20 mm.) a small amount of the tissue was used for transplantation into other rats of the same strain. The remaining tissue was finely ground, mixed with an equal volume of 95 per cent alcohol, and allowed to stand for 24 hours at refrigerator temperature. The mixture was then filtered and two volumes of 95 per cent alcohol added to the filtrate. After a second refrigeration the resulting precipitate was filtered off. The clear filtrate thus obtained was concentrated to about one-tenth of its original volume by vacuum distillation. The final product was a somewhat cloudy "concentrate" with an alcohol content of from 15 to 26 per cent.

Rats of one litter were implanted on the right side with approximately equal sized grafts of tumors native to their strain. When the grafts had attained a size of about 20 x 8 x 5 mm., part of the rats were injected intratumorally daily with 0.5 to 1 cc. of homologous concentrate. Other rats were left untreated to serve as controls, or were injected with a control solution. Among these controls were: extracts from beef muscle, from normal rat tissue and solutions containing known amounts of alcohol.

Fifty-six of the 58 tumors thus treated were destroyed from three to five and occasionally as many as nine to fourteen injections being required for complete oncolysis. No oncolysis was noted in 45 litter-mates similarly injected with control solutions. Some of the tumors treated with control solutions became necrotic and opened to the surface. Nevertheless, the malignant cells continued to multiply and the tumor increased in size until it brought about the death of the host. Not one of the 25 rats healed by the "concentrate" and kept alive for many months had a recurrence of the tumor.

The remaining 32 healed rats were implanted on the opposite side with a graft of the same type of tumor as that destroyed. The grafts grew in every one of the untreated control rats, but failed to grow in 25 (78.1 per cent) of the 32 rats whose tumors had been destroyed by injections of "concentrate." These 25 apparently immune rats were later implanted with graft of a second sarcoma that had originated in the same strain. Fifteen of these rats proved to be resistant to growth of these heterologous grafts.

Five healed and immune female rats were mated with five healed and immune males. When the offsprings were 30 days old, they and their parents were engrafted with a fragment of the same kind of tumor which had undergone oncolysis in the parent. The grafts grew in every one of the offspring, but did not grow in the parents.

This work is of basic theoretical interest since it is the first experiment in which the injection into tumors of an oncolytic substance has brought about an immunity to tumors homologous to a specific rat strain. Heterologous post-oncolytic tumor immunity was previously reported

by Gross,² Lewis³ and others. Attempts to determine the exact mechanism of this post-oncolytic homologous tumor immunity are now in progress.

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"CANCER OR CANCERS?"

Cancer or cancers? Oberling,⁵ in his excellent monograph, "The Riddle of Cancer," answers this question in a manner generally satisfactory to students of the subject:

"To the experimentalist the idea that cancer is a whole group of disorders, each with a different cause, is wholly unsatisfactory since no matter how strongly the etiological dissimilarities be emphasized cancer to him is one disease, and one disease only. He sees always the same cellular derangement, marked by exalted proliferation, invasive growth, and above all the impudent independence that is called autonomy."

Although the tissue in which the cancer cell primarily arises contributes, through local tissue reactivity, a superficial histological definitiveness to the malignant lesion so that gastric carcinoma is, for example, usually distinguishable from carcinoma of the esophagus, the identity of the site of origin becomes less certain as the malignancy of the tumor increases. In other words, as the number of definitive cancer cells within a tumor increases, the lesion bears a decreasing resemblance to the tissue within which it arose so that the most malignant tumors, generally, resemble the tissue of their origin least and each other most.

Modern pathology has generally discarded any but a tentative morphological distinction between carcinoma and sarcoma.² Any attempt to sustain rigid distinctions in the classification of the infinite gradations in the exhibition of the notably pleomorphic cancer cell must lead to complete failure. Past efforts in the classification of cancer are reflected in such terms as "carcinosarcoma," "sarco-carcinoma," "sarcomatoides," "pseudo-carcinoma," etc. Even such expansive nomenclature proves inadequate to describe the not uncommon instances in which a carcinomatous exhibition of cancer is found merging into or metastasizing as sarcoma, or vice versa. Although most exhibitions of cancer in man appear undoubtedly to reflect a common fundamental process, the classification of cancers according to their anatomical site and degree of anaplasticity, of course, remains clinically a practical necessity.

In examining the so-called "etiological dissimilarities" in cancer, a distinction should be made between contributory etiological factors and the final-common-pathway by which the effects of these diverse factors are mediated. Thus we may speak of many etiological agents for inflammation, and yet recognize a chain of morphogenetic phenomena common to them all. If it is true, therefore, that all cancers represent essentially the same morphogenetic process, it follows that careful examination of the nature and etiology of a specific exhibition of cancer

should afford clues as to the property of all malignant tumors.

In a summary which he wrote in 1903, Marchand first pointed out that chorionepithelioma possesses great theoretical importance in regard to tumor formation. At that time the polemic on the maternal vs. the foetal origin of chorionepithelioma had not yet been resolved, though the weight of evidence was already tipping in the direction of Marchand's thesis of "foetal" origin.

That primary uterine chorionepithelioma represents the cancerization of the maternal host by the trophoblast of the conceptus is now universally accepted. And though the malignancy of this tumor is not exceeded by that of any known exhibition of cancer, it is significant that the so-called malignant cell here is a trophoblast cell (Langhans cell) indistinguishable morphologically or biologically from the same cell in the chorion of normal pregnancy.⁶ In other words, primary uterine chorionepithelioma represents the simple overgrowth of the physiologically malignant trophoblast¹ as a result of the lack of a humorally mediated substance by which such overgrowth is prevented in the course of normal gestation. This is shown by the fact that when the trophoblast plus the definitive embryo are cultured *in vitro* the trophoblast erodes, infiltrates and destroys the latter in, as Maximov phrases it, "the absence of the checking influence of the mother."⁴ Thus it is clear that one of the most malignant exhibitions of cancer known may arise without the mediation of "mutations," viruses or chemical carcinogens.

The morphogenesis of primary uterine chorionepithelioma and its metastases is clear. Following the meiosis (gametogenesis) of a diploid totipotent cell, a haploid gametogenous cell is produced which, in the normal process of reproduction, is activated by fertilization. Following this the trophoblast is segregated from the non-trophoblast cells of the early conceptus; and it is the trophoblast that, through its "physiologically malignant" properties, infiltrates the maternal host to establish an adequate decidua. Failure of the host to check this trophoblastic growth, of course, may result in the overgrowth of chorionepithelioma. It is not, therefore, without significance that such chorionepithelioma represents the only exhibition of cancer in which an introduction of a new cell type does not accompany the so-called malignant change.

It is significant, however, that chorionepithelioma is not always confined to the reproductive organs nor is it found only in the female. Testicular chorionepithelioma as well as primary extra-genital chorionepitheliomas in both sexes present cytrophoblast that is indistinguishable from that of the normal pregnancy trophoblast. It is generally accepted that testicular chorionepithelioma arise from germ-cells (diploid totipotent cells²), but the fact is usually overlooked that such cells must first undergo meiosis to produce the trophoblast-competent gametogenous cell that has, as the only alternative to death, the initiation (by division) of a genetically unique life-cycle through the initial production of trophoblast. It is thus of the utmost theoretical importance that the trophoblast cell has *never* been found outside the canalization of normal pregnancy except as one of the most malignant exhibitions of cancer. And unlike all other cells of the life-cycle, the trophoblast cell is the only cell that has never been found ectopically except as cancer.

In recent years several well authenticated cases of primary extra-genital chorionepithelioma in the male have been reported. Of these a case described by Stowell Sachs and Russell⁷ of a primary chorionepithelioma of the pineal gland of a 15-year-old boy is of particular interest, since scrupulous serial examination of the testes apparently ruled out the possibility of an obscured primary testicular growth. The low level of tissue reactivity in the pineal gland and brain probably accounts for the fact that the trophoblast cells were not obscured nor masked as they so frequently are in testicular growths

for example, where the bulk of them may be exhibited in the matrix of somatic tissue of adenocarcinoma, seminoma or sarcoma and where only small nests of overt chorionepitheliomatous cells, plus the cytrophoblastic proliferation in the urine, attest the trophoblastic nature of the malignant component.

A number of primary genital as well as extra-genital chorionepitheliomas have been reported in which the overt trophoblast cells have merged by imperceptible degrees into the "masked" trophoblast of adenocarcinoma or sarcoma—or metastasized as such. And primary sarcoma and adenocarcinoma have been described as metastasizing as chorionepithelioma. It is clear, therefore, that if we accept the thesis of the fundamental identity of all exhibitions of cancer and understand the morphogenetic phenomena of but one type—chorionepithelioma—it follows that we must ascribe the same phenomena to the remaining types. Besides being Euclidean in its clarity this deduction is consonant with the axiom that cells of the same type arise from preexisting cells of the same type, as expressed in Bard's extension of Virchow's famous dictum of *omnis cellule e cellule* to *omnis cellula e cellula ejusdem generis*. While the trophoblastic nature and diploid-totipotent-cell origin of all exhibitions of cancer is the certain corollary of the concept of the fundamental identity of them all, any alternative to the unitarian thesis, in view of the evidence yielded by chorionepithelioma, will inevitably lead to a *reductio ad absurdum*.

Morphogenetically, then, the common malignant component in all exhibitions of cancer is the trophoblast cell (however masked morphologically) and the common cell of origin is the ubiquitous totipotent cell, the potency of which has been reserved since early cleavage. This simply means that the cancer cell is the most primitive cell in the life-cycle of the animal: that this cell is normally a component of the life-cycle and does not arise through spontaneous generation. This, of course, is consistent with the imperfectly defined and widely held idea of the "embryonic" nature of cancer.³ And just as the presence of bacteria or other foreign agents in the body can evoke a wide variation in the kinds of tissue reactivity, depending upon the tissue affected, etc., so can the ectopic trophoblast cell elicit a variety of exhibitions of cancer besides frank chorionepithelioma.

The means by which such etiological agents as the chemical carcinogens, certain metabolites, possible viruses, radiation, etc., converge into the final-common pathway mediating the meiosis of the totipotent cell and the activation of the consequent gametogenous cell to trophogenesis are not fully understood. To say that such action is one of organizer stimuli upon competent cells is merely to restate rather than to explain the phenomenon.

Certainly, further advances in our knowledge of the endocrinology of reproduction promise to answer many questions in the field of oncology; while the means by which the conceptual trophoblast is first checked in its growth and then destroyed in the course of normal gestation, probably offers a very rewarding route for further investigation.

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BOOK REVIEWS

PRACTICAL MALARIOLOGY. By Paul F. Russell, M.D., M.P.H., Colonel M.D., A.U.S., Parasitology Division, The Army Medical School, Luther S. West, Ph.D., Head of Biology Department, Northern Michigan College of Education, Major, Sn.C., A.U.S. (Reserve); formerly Entomologist, Parasitology Division, Army Medical School, and Reginald D. Manwell, Sc.D., Professor of Zoology, Syracuse University, New York, formerly Captain, Sn.C., A.U.S., Protozoology Section, Parasitology Division, Army Medical School. Forward by Raymond B. Fosdick, President of The Rockefeller Foundation. 238 illustrations, 8 in color. W. B. Saunders Company, Philadelphia, 1946. Price \$8.00.

Many American physicians had experience with malaria for the first time in World War II. Knowledge concerning this most frequent of diseases was greatly advanced by the war. Suppressive chemical therapy, and particularly control of malaria by the use of measures such as D.D.T., greatly altered the military story of the Pacific Theater.

This excellent book outlines the whole problem of malariology and includes much material available through the National Research Council. Readers who served in the military forces will find in it much to refresh their memories of experiences in the tropics.

It should be emphasized that the study of malaria is not just a clinical study, but one encompassing all aspects of the disease. In fact in this book only 60 of the 661 pages deal with the disease in man. The remainder are divided into sections on the parasite, the mosquito, the community, prophylaxis and control and into an appendix with a key to world anophelines.

As stated in the title the book is practical. It is a beautiful piece of work, well illustrated, attractive and clear. All students of the subject will find pleasure in reading this volume, and those in the field will find it concise, practical and useful.

THROUGH THE STRATOSPHERE—THE HUMAN FACTOR IN AVIATION. By Maxine Davis. Cloth. Price, \$2.75. Pp. 253. New York: The MacMillan Company, 1946.

The glamor which surrounds aviation is made of resilient material. This time it encloses the story of aviation medicine. Miss Davis is a reporter, an observant one. She has obtained her information from headquarters and from flying fields. In a very clear introduction she outlines her tale as that of a journalist, and throughout the book she records in most interesting fashion her personal experiences, mixed with official material from the Pentagon. If she has been too credulous in the acceptance at face value of some of the latter she has erred very humanly. The interpretations of technical programs are well done, even though they may at times be difficult for the layman. The descriptions of men and of places will recall pleasantly one's own experiences if one has been with the air forces.

The details of the story begin with a description of the fliers' classification program of the U. S. Army Air Forces. Next is an account of the hazards of altitude—cold and anoxia. Various other aspects of aviation medicine are covered in order: G-suits, the care of fliers and their equipment, food, the prevention of infectious disease, actual personal medical care, visual aids, parachute descent, combat fatigue and flying fatigue, air evacuation and convalescent care. The specific roles of the squadron flight surgeon, the personal equipment officer, the flight nurse and the air-ground rescue unit of the C.B.I. Theatre are developed.

In summary, one may term this a layman's textbook of aviation medicine in World War II. It is recommended reading.

THE NORMAL ENCEPHALOGRAPH. By Leo M. Davidoff, M.D., and Cornelius G. Dyke, M.D. Second Edition, Thoroughly Revised, Illustrated with 155 Engravings. Lea & Febiger, Philadelphia. Price \$5.50.

Dr. Davidoff and Dr. Dyke (now deceased) have both had extensive experience in the study and interpretation of Encephalograms as well as with the associated surgical problems.

This volume presents a complete story of the historical development of Encephalography and the various technical methods employed in the introduction of gases into the subarachnoid spaces and the ventricular system.

The roentgenological aspect is also covered, both as technique and interpretation of the films.

The indications and contraindications, as well as the reactions to encephalography, are discussed in detail.

Considerable space is devoted to the appearance of normal encephalograms and a careful analysis is made of the entire ventricular and subarachnoid systems as they appear in the films. This section is well illustrated with numerous roentgen ray films in addition to diagrammatic illustrations and photographs of anatomical specimens.

This monograph is comprehensive in every detail and should be a part of the library of all Neurologists and Neurosurgeons, as well as Roentgenologists who are interpreting encephalograms.

ESSENTIALS OF MEDICINE. By Charles Phillips Emerson, Jr., A.B., M.D., and Jane Elizabeth Taylor, R.N., B.S., M.Ed. Fifteenth Edition. 201 illustrations in Black and White and Four Color Plates. Copyright, 1946, by J. B. Lippincott Company, Philadelphia. Price \$3.50.

This book, now in its 15th edition, ranks among the best of its kind. The new edition has been carefully revised, brought amazingly up to date, and seems destined for wide acceptance by those engaged in the instruction of nurses.

Noteworthy, it seems, is the masterly balance maintained between the wealth of facts contained, and their practical application in nursing. Somewhat difficult medical subjects are rendered more easily understandable by the physiologic approach, with nursing techniques often being emphasized as a part of this physiologic concept. The book is well illustrated, and the new double column type will no doubt be appreciated by students. The new unit arrangement for consideration of subject matter (one unit being devoted particularly to nursing care) certainly seems an improvement over former editions. Quite naturally, one could find ground for slight disagreement with the medical author on certain statements in the text, but these disagreements are of no moment, and would serve only to detract from an excellent work.

The book is recommended to those who are seeking a text for teaching nurses the fundamentals of internal medicine.

DIAGNOSIS AND TREATMENT OF ACUTE MEDICAL DISORDERS. By Francis D. Murphy, M.D., F.A.C.P. Second Edition, 27 illustrations, 510 Pages. F. A. Davis Company, Philadelphia, 1946. Price \$6.50.

This medium sized volume is devoted to the practical considerations in the management of the acute episodes of medical diseases. It is the accumulation of a lifetime of the author's experiences. The print is large and clear. Scattered sparsely through the work are illustra-

tions covering special points. This volume is the second edition. The first edition was published in 1945.

The contents are divided into 25 chapters such as Vascular Disease, Diseases of the Blood, Heart, Metabolism, etc. The author no doubt had good reasons for dividing the heart into four chapters, the lungs into three chapters, etc. It is felt that it would clarify the matter, however, if topics relating to one subject, such as the heart, be grouped under one chapter. Sub-topics might be arranged to better advantage in their respective chapters, e.g. Tetany with Hypoparathyroidism instead of with the section on Diabetic Coma; Subarachnoid Hemorrhage grouped with Cerebral Hemorrhage instead of following the topic Carotid Sinus Syndrome; Lung Abscess with the Pneumonias, etc. The above suggestions seem to group related topics closer together.

Since new editions are to come out, the author will keep the volume corrected to suitable new data in diag-

nosis and treatment. A few suggestions might be pertinent now: (1) Muscle Poisoning by the dinoflagellates, which is a serious acute medical emergency, seems more important in this country than the bite of a cobra; (2) BAL (dimercaptopronal) in the treatment of Acute Arsenic and Acute Mercurial Poisoning; (3) Propylthiouracil in the discussion on treatment of hyperthyroidism; (4) Penicillin may be a specific for psittacosis.

It is difficult for any one text to keep up with all of the advances in the clinical use of the sulfa drugs, Penicillin and Streptomycin. These drugs and antibiotics are best reviewed by reading current medical journals.

Aside from these minor points, the author is to be congratulated for his vision and for having written such an important book. It bridges the gap between a comprehensive text book and a small hand book on medical diseases. This volume should be an integral part of the library of the general practitioner and internist.

MEDICAL JURISPRUDENCE

MALPRACTICE; SUFFICIENCY OF EVIDENCE; CORRECTNESS OF DIAGNOSIS

HARTLEY F. PEART, ESQ., *San Francisco*

In a case sent to it on appeal, the District Court of Appeal rendered a decision in a malpractice suit arising out of the following facts and circumstances:

Plaintiff Mrs. R. consulted defendant, a physician and surgeon, relative to an itching in the region of her vagina. After taking plaintiff's history, defendant made a smear from the vagina, urethra and cervix, and, after a microscopic examination of the smear, told plaintiff that she had gonorrhea. Plaintiff and defendant then discussed the possible source of her infection, defendant telling her that in all probability she could have contracted the disease only by sexual contact. Plaintiff informed the defendant that the itching had occurred shortly after intercourse with her husband two days previously. Defendant then told plaintiff to talk to her husband or, if she preferred, that he would talk to him. Defendant prescribed treatment for the plaintiff which, among other things, consisted of tablets containing sulfanilamide.

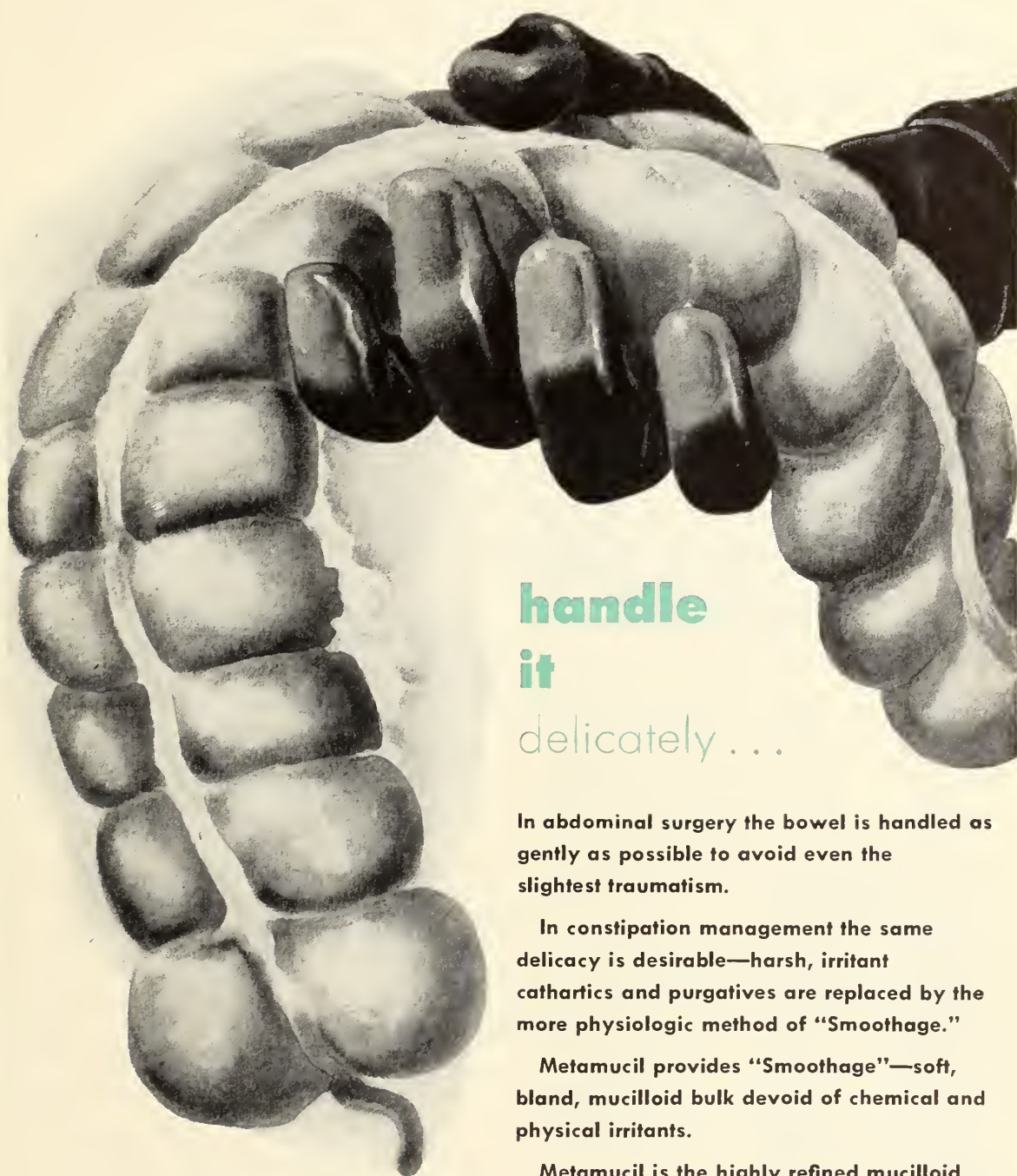
Two days after defendant's consultation with the plaintiff, the plaintiff's husband consulted the defendant, who endeavored to obtain a smear from the entrance of the husband's urethra, but was unsuccessful. He did, however, obtain an imprint which he examined microscopically, and then expressed doubt to the husband as to whether he was afflicted with gonorrhea, but told him that he was convinced that his wife was suffering from the disease and he considered it advisable for the husband to commence treatment immediately. The husband never returned to the defendant for further treatment.

The next day the plaintiff and her husband went to another doctor who made smears and sent them to a laboratory for examination. The results of this examination were negative, whereupon this doctor declared that neither the plaintiff nor her husband was suffering from gonorrhea. A few months after this plaintiff and her husband commenced the present action against the defendant, whereupon the defendant sent the slide containing the smear from the plaintiff's wife, to two laboratories where the "gram negative stain" test was applied

and both laboratories reported a positive reaction showing gonococci.

Plaintiff wife and her husband sought to recover damages from the defendant physician for alleged malpractice. The trial was had by the court without a jury and resulted in favor of the defendant physician. Plaintiffs appealed from that judgment. The District Court of Appeal of the State of California upheld the lower court and stated that there was insufficient evidence to sustain a judgment against the defendant in favor of either or both of the plaintiffs. In its discussion the court stated that it had to first answer the question of whether the evidence was sufficient to sustain a judgment against the defendant. The court held that in California a physician and surgeon is not required to make a perfect diagnosis, but is only required to have that degree of skill and learning ordinarily possessed by physicians of good standing practicing in the same locality and to use ordinary care and diligence in applying that learning in the treatment of his patients. Continuing, the court declared that the evidence in the instant case disclosed that it was the ordinary practice of physicians and surgeons in the community in making diagnoses for gonorrhea to use either the "methylene blue test" or the "gram negative stain test," saying further that at the time the plaintiff consulted the defendant he had made the methylene blue test which showed that she was suffering from gonorrhea. Subsequently, the same slides were submitted by him to two independent laboratories where the gram negative stain tests were made showing the presence of gonococci. The court concluded from this that there was substantial evidence to support the finding of the trial court that the defendant physician had used the requisite skill in diagnosing the plaintiffs' complaint. Further, that this was also true as to the defendant's conduct toward the plaintiff's husband.

The District Court of Appeal therefore affirmed the judgment of the lower court, which had held that the plaintiffs had failed to produce sufficient evidence to sustain a verdict against the defendant physician for alleged malpractice.



handle
it
delicately . . .

In abdominal surgery the bowel is handled as gently as possible to avoid even the slightest traumatism.

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(Continued on Page 44)

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(Continued from Page 42)

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 Schnuck, Harry, *Encinitas*
 Skeoch, Gordon D., *San Diego*
 Trotter, J. T., *San Diego*
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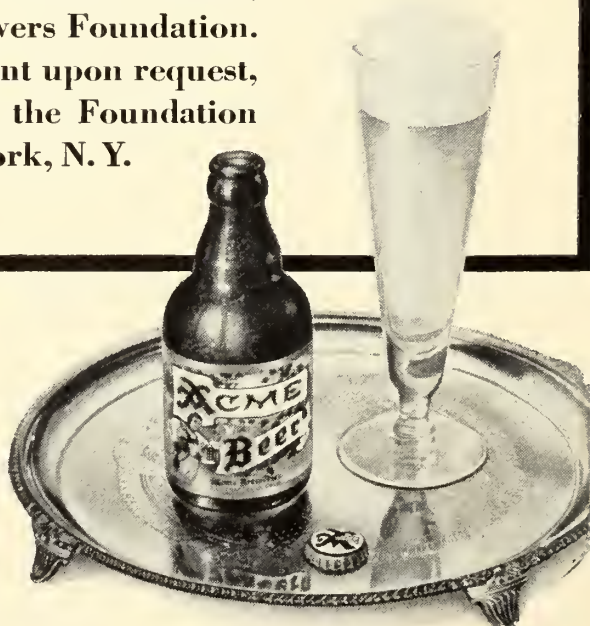
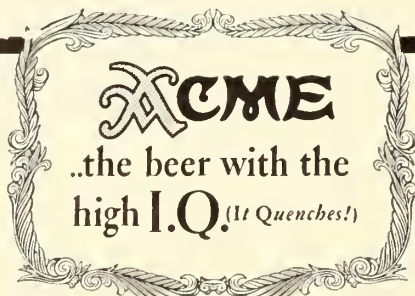
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 Lemanski, Alice M., *Palo Alto*
 Long, Gabe C., *San Jose*
 Meyer, Vincent S., *Los Altos*
 Morton, Paul V., *San Jose*
 Ness, Ansten R., *Los Gatos*
 Rosehill, David B., *San Jose*

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 Woolz, Emily, *Vallejo*

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 Beadner, Sol A., from *San Diego County* to *San Francisco County*
 Binger, Grace Dunn, from *San Francisco County* to *Santa Clara County*
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(Continued on Page 48)



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- Downing, George C., from *San Francisco County* to *Santa Clara County*
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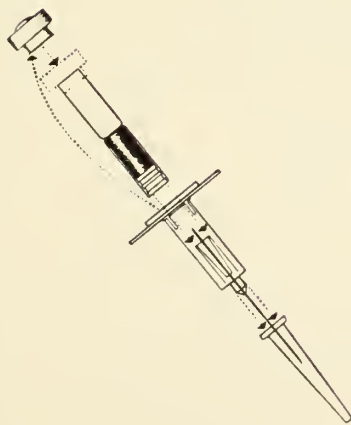
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BOARD OF MEDICAL EXAMINERS

By FREDERICK N. SCATENA, M.D.

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Board Proceedings

The Board of Medical Examiners met at the Business and Professions Building in Sacramento, October 21-24, to elect officers for the ensuing year and conduct hearings on petitions for restoration and disciplinary matters. Herbert S. Chapman, M.D. was elected president to succeed Frank W. Otto, M.D. Joe Zeiler, M.D. was elected vice-president to succeed Herbert S. Chapman, and Frederick N. Scatena, M.D., was re-elected Secretary-Treasurer.

We have at present approximately 70 applications on file for the written examination. This group contains more graduates from schools outside the State of California than were examined at the other scheduled examinations throughout the year. The number of applicants for written examination has remained approximately the same each year for the past five years.

Reciprocity applications are still being filed in numbers

which far exceed the usual number of applicants for the pre-war period. From January 1, 1946, to September 30, 1946, 1,517 applications for reciprocity have been filed. This includes applicants basing their applications on licenses issued by other states, National Board, and Government Credentials.

During the same period, 1,557 certificates have been issued to physicians and surgeons. Of this number, 305 were issued following written examination, forty-six on government credentials, 183 on national board credentials, 177 based on licenses issued by other states and after the successful passing of an oral examination, and 846 on direct reciprocity.

The opening brief on the case of Aarons, Burroughs and Mann vs. Board of Medical Examiners has been filed in the Appellate Court. A favorable decision is hoped for in this matter as the decision will be a far-reaching one in determining whether or not the Board has the authority to declare a school disapproved, or whether the Superior Court can assume this function.

(Continued on Page 56)

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*N. Y. State Journ. Med. 35 No. 11,590
Laryngoscope 1935, XLV, No. 2, 149-154

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The author—Joseph B. Rosner, M.D., Rehabilitation Executive of the National Jewish Hospital, Denver, Colo.—states that many hospital directors have found that tuberculous patients died or suffered a relapse within six to 18 months after discharge. "Reasons for these breakdowns were not difficult to determine," he says. "Sudden transition from the sheltered environment of the hospital to the tensions of modern society, the change from a regime of no work to an abrupt schedule of a full day's work, usually at an occupation that was medi-

cally unsuitable, were the causes of many of the readmissions."

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2. A capable nursing staff will carry out the physician's orders that rest is properly observed and medications administered.

3. Many patients present mental and emotional prob-

(Continued on Page 64)

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TUBERCULOSIS PATIENTS

(Continued from Page 58)

lems of such an intensity that the progress of treatment is seriously impeded. . . . It is necessary either to have a psychiatrist in residence at the hospital or have his services available for patients whose condition indicates such a need.

4. The tuberculous person has most of the problems of the average healthy individual, plus several problems peculiar to his disease. His worries may range from failure to adjust to certain aspects of hospital routine to concern over domestic financial matters. For problems of a social, emotional or economic nature, every hospital should have a qualified medical social worker with some psychiatric casework training in order to carry out the recommendations of psychiatrists. Freedom from worry helps make victory over tuberculosis easier.

5. In most instances it is not wise for a patient to return to the occupation in which he was engaged before becoming ill. A trained vocational counselor should, by means of interviews and tests, determine interests and aptitudes. In cooperation with the medical staff, this counsel should help the patient reach a wise decision regarding his vocational future.

6. The occupational therapist furnishes the patient, in accordance with medical prescription, with projects that can be undertaken safely while still on complete bed-rest or on a partially ambulatory regimen.

7. Increasingly, patients in hospitals are using the time necessary for curing to complete high school or college training or to acquire a marketable skill such as typing, shorthand bookkeeping or switchboard operation. Better hospitals have schools right on the grounds, employing teachers of academic and business subjects.

8. In hospitals where patients remain for long periods, a trained librarian and a complete library are prime necessities.

9. Provision should be made for religious observance and for time with spiritual advisers for patients who desire solace and understanding. Adequate chapel space for worship and arrangements for visiting clergymen of different faiths can be an important contribution toward recovery.

**EMOTIONAL STRESS UNDERLYING
FACTOR IN CHRONIC HEADACHES**

The most effective treatment of chronic headaches includes both drug therapy and psychotherapy—the straightening out of the patient's emotional problems, according to three New York doctors writing in the November 2 issue of *The Journal of the American Medical Association*.

The doctors—Arnold P. Friedman, Charles Brenner and H. Houston Merritt—are from the Division of Neuropsychiatry, Montefiore Hospital and the Department of Neurology, College of Physicians and Surgeons, Columbia University.

The great majority of chronic headaches are caused by one of three conditions—migraine, injury or emotional stress. The pain, which is probably produced by a constriction of the blood vessels, is precipitated and made worse by emotional tension and inner conflict.

"It has been our experience," state the doctors, "that a combination of psychotherapy and the drug therapy is much more effective than the latter alone in reducing the frequency, duration and severity of any of the three types of headache which we are discussing. Indeed in

(Continued on Page 74)

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CHRONIC HEADACHES

(Continued from Page 64)

the majority of these patients medication is chiefly of value in relieving the discomfort of the acute attack, and it is only by reducing the amount of mental stress to which the patient is subjected that the headaches can be reduced in frequency and severity and often rendered easier to control by suitable medication when they do occur."

The authors point out that "the psychologic problems vary greatly from patient to patient. In some they may be largely the result of an unfavorable environmental situation which must be changed for improvement to result. In others the difficulty is primarily in the inner life of the patient, with the result that he cannot adjust adequately even to the usual demands of his daily life. Advice as to mental hygiene, reassurance and the opportunity to ventilate his anxieties and conflicts are psychotherapeutic aids which are within the province of the practitioner and which in favorable cases will result in good psychotherapeutic results. In other cases in which the patient's mental difficulties are more severe or more deeply repressed and hence less accessible to therapeutic influence, it seems best to refer the patient to a specialist."

HEAVY SMOKERS SUSCEPTIBLE TO LEUKOPLAKIA—A MOUTH DISEASE

A Cleveland physician, Clyde L. Cummer, warns heavy smokers to beware of leukoplakia—a disease which coats the lining of the cheeks, the gums, tongue and roof of the mouth with white, thickened patches that sometimes crack.

Writing in the November 2 issue of *The Journal of*

the American Medical Association, Dr. Cummer says he examined 587 patients, 315 of whom were men. Six of these men, in the age group between 40 and the late 70's, had leukoplakia.

After reviewing medical literature, Dr. Cummer found that 53 cases of leukoplakia involving the roof of the mouth have been reported to date. Of the 51 in which the sex was mentioned, 49 occurred in men and two in women. All but three of these patients were tobacco smokers, with pipe smoking being incriminated more often than cigar or cigaret smoking.

"The type of smoking is important," he says. Dr. Cummer cites another investigator who "expressed his conviction that the pipe is the most irritating agent and emphasized the importance of the method of smoking in the localization of leukoplakia. It is suggested that pipe smoking is especially likely to produce palatal changes since the stream of hot and unfiltered smoke is delivered directly against the roof of the mouth, whereas cigaret and cigar smoke is to some extent filtered through the stub or butt and is diffused through the entire oral cavity."

The most effective treatment for this disease is to stop smoking, especially pipe smoking. In the case of inveterate, confirmed smokers, the author suggests the wearing of a denture to protect the palate.

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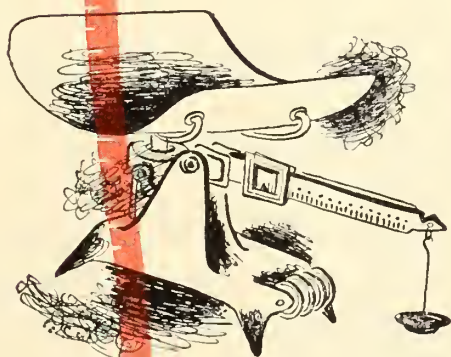
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INVESTIGATORS FIND NEARLY 300 CANCER PRODUCING AGENTS

"Even the most pessimistic scientist cannot possibly read of the progress made in cancer research during the last 30 years without thrilling at the accomplishments and the spirit of success that fairly permeate this field," according to an article in the current issue of *Hygeia*, health magazine of the American Medical Association.

The author—Arthur H. Wells, M.D., Chairman of the Committee on Cancer of the Minnesota State Medical Society—states that "approximately 300 physical, chemical and infectious agents have been found to produce cancer. Many authorities admit that there is an ever increasing variety of agents being discovered which will initiate cancer growth. However, they refer to Ewing's casual

genesis and formal genesis of cancer. The first has to do with the wide variety of substances that will produce cancer and the second to the factors within the cancer cell that are responsible for its nature and its unlimited growth capacity. The most important progress in the future appears to lie in a thorough understanding of the formal genesis of cancer.

"Listed among the cancerous agents are aniline dyes, petroleum products, illuminating gas, coke, mineral and lubricating oils, textile products, radium bearing ores, cobalt and arsenic, chromates, nickel, carbonyl, asbestos, mesothorium, anthracene, oil, aromatic amino compounds, benzol, ultraviolet rays, roentgen rays and others. These products are found in industries and necessitate protection of those exposed to the products."

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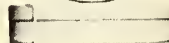
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The Natural History of Hemolytic Streptococcus Sore Throat*

LOWELL A. RANTZ, M.D.,† *San Francisco*

INTEREST in hemolytic streptococcus respiratory disease has increased constantly during the last decade. This has been the result of the accumulation of evidence that rheumatic fever is a sequel to infection by these organisms, and of the development of improved methods for the study of disease caused by them.

The close relationship between hemolytic streptococcus infection and the rheumatic state has been demonstrated by a number of observations that are indirect in nature¹: 1. Rheumatic fever has been observed to follow known hemolytic streptococcus infections, particularly of the respiratory tract. 2. Epidemics of rheumatic fever often follow outbreaks of scarlet fever or streptococcal sore throat. 3. Recrudescences of activity frequently appear when infection by hemolytic streptococci occurs in persons who have previously undergone attacks of rheumatic fever. 4. Immunologic investigations have indicated that high titers of various antistreptococcal antibodies and cutaneous hypersensitivity to products and fractions of hemolytic streptococci are usually demonstrable in persons suffering from acute fever or from recurrences of this disease.

In addition, more direct information has been obtained recently during a critical study of hemolytic streptococcal disease in military personnel.⁸ The results of this work demonstrated that rheumatic fever occurred only as a result of infection by hemolytic streptococci.

It is the purpose of this paper to describe

briefly the significance of recent developments in the bacteriology of hemolytic streptococcus disease, to recall the historical development of the modern concept of the natural history of infection by these organisms, and to summarize the information obtained during the previously mentioned study in regard to the nature and course of streptococcal disease as it occurred in young adults.

BACTERIOLOGY

The important contributions of Lancefield have clarified greatly the bacteriology of the hemolytic streptococcus and have permitted the establishment of important clinical facts. These may be summarized:

1. Hemolytic streptococcal respiratory infections are nearly always caused by organisms that are members of a single serological group, designated by the letter "A". A large number of types have been identified within this group. It is discovered, when typing is performed, that, during any season in any community, a relatively small number of different types will be responsible for nearly all infections, both respiratory and non-respiratory.

2. There is no essential difference between hemolytic streptococcal sore throat with (scarlet fever) and without rash. It is true that the average example of the former disease is somewhat more ill than the latter, but there is much overlapping. The incidence of serious complications is similar in both types of disease. Recent studies indicate that there are many types or strains of streptococci that are unable to induce rash formation in susceptible individuals, but do produce important and disabling disease. Because of this fact and because many individuals have immunity to the erythrogenic toxin, infection without rash formation occurs much more frequently and is more important.

† From the Department of Medicine, Stanford University School of Medicine, San Francisco.

* Read before the Section on Medicine of the California State Medical Association, May 9, 1946, and before the General Session of the Utah State Medical Association on August 29, 1946.

The work described in this paper was conducted under the auspices of the Commission on Hemolytic Streptococcal Infections, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, Preventive Medicine Service, Office of the Surgeon General, United States Army.

NATURAL HISTORY

The present concept of the natural history of hemolytic streptococcal infection has been developed over a period of 40 years. All of the salient features of this group of diseases were elucidated by Escherich and Schick in 1912.⁵ These authors described the nature and course of scarlet fever in detail several years before the streptococcal etiology of this disorder was finally established by the Dicks³ and Dochez.⁴

The course of scarlet fever as observed by Escherich and Schick has been diagrammed in the figure, using terminology supplied by sub-

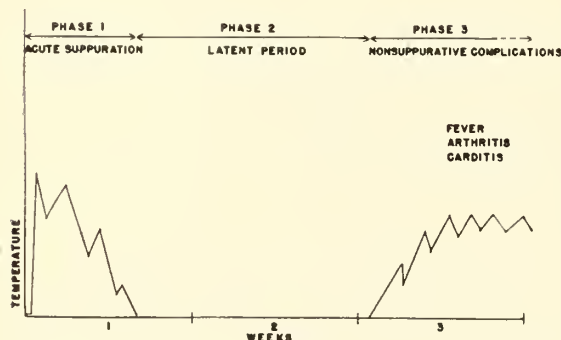


Diagram of the Natural History of Hemolytic Streptococcus Sore Throat. (Modified from Escherich and Schick.)

sequent authors. It was proposed that the illness frequently consisted of three parts, the first of which, the acute supplicative phase, was caused by the direct invasion of the tissues of the throat by the etiological agent and was associated with fever, angina, and rash. The events of this phase were very often followed by the complete recovery of the patient. Occasionally supplicative complications such as otitis media or peritonsillar abscess might supervene as the result of the invasion by the streptococcus of the tissues and organs adjacent to the throat. In certain cases a "latent period," during which apparent recovery occurred, was followed by the more or less explosive outbreak of a new disease characterized by the appearance of fever, arthritis, carditis, lymphadenitis, nephritis, and other lesions in various combinations. These disorders were not the result of the spread of streptococci to tissues remote from the nasopharynx nor was there pathological evidence of true suppuration. This phase of streptococcal infection has more recently become known as the period of "late nonsuppurative complications".⁷

The accuracy of this concept has been repeatedly confirmed in relationship to scarlet fever. It has not been appreciated clearly that a similar sequence of events may also follow the much more frequent and often mild cases of streptococcal respiratory disease without rash.

Considerable difference of opinion has existed as to the relationship between poststreptococcal arthritis and carditis, and classical rheumatic fever. The accumulated evidence of recent years,

which has been mentioned previously, has established convincingly the fact that the two disorders, often previously regarded as distinct entities, are actually the same process and have the same pathogenesis.

EXPERIMENTAL STUDY

All the cases of acute respiratory disease admitted to a large station hospital were studied by appropriate clinical, clinico-pathological, bacteriological, and immunological techniques during their hospital stay and over a follow-up period. These procedures permitted the separation of the cases into groups. In approximately 400 the etiological agent of the infection was the Group A hemolytic streptococcus; in 1,100 the etiology was not established but the infections were presumably of virus and definitely not of streptococcal origin. None of the patients in the latter group developed arthritis. Involvement of the joints did appear following the acute initial illness in 19 of the men infected by streptococci, and in 15 the disease could be regarded as typical rheumatic fever.

Three hundred and forty-two of the cases of hemolytic streptococcal infection were studied in great detail over a period of three or more weeks. The information obtained has been used to prepare the following resume of the natural history of Group A hemolytic streptococcus infection in young adults.

The Acute Disease. Hemolytic streptococcal infection of the respiratory tract, as observed during this study,¹⁰ was a febrile illness usually of acute onset and associated with the expected manifestations of such disorders, including chills, headache, generalized aching, and variable degrees of prostration. Many cases were excluded by the artificial method of selection, which required the presence of fever as an indication for hospitalization, and it must be constantly borne in mind that mild and inapparent infections are probably extremely common. Twenty-five per cent of definitely infected men in a carefully studied food-borne outbreak of hemolytic streptococcal sore throat were afebrile and virtually symptom free.⁹

The characteristic symptom was sore throat which was rarely absent and ordinarily severe. Cough and coryza were often present but usually not prominent complaints. The rarity of occurrence of hoarseness was notable.

Clinically typical hemolytic streptococcal sore throat was observed most frequently in men in whom the tonsils were intact, and was characterized by varying amounts of tonsillar and pharyngeal exudate, and varying degrees of redness and edema of the pharyngeal tissues. Tender anterior cervical adenitis was nearly always noted. The concatenation of these signs permits the diagnosis of infection by hemolytic streptococci with a high degree of accuracy, even without the bacteriological study of the throat flora.

A large number of cases remained, however, in which the diagnosis was more difficult since

certain of these signs, particularly exudate, were absent. This was especially so if the tonsils had been removed. No difficulty arose if marked pharyngeal edema was observed in such cases but there were approximately 10 per cent of the whole group of proved streptococcal infections in whom no, or only minimal swelling of the throat could be discerned. In such persons the presence of tender adenitis in the neck, abnormal redness of the throat, and large numbers of hemolytic streptococci in the nasopharyngeal flora permit a reasonably accurate differentiation from other types of respiratory infection. A certain number of adult patients with respiratory infections will always be discovered in whom a definite diagnosis cannot be made on clinical grounds, even though large numbers of Group A hemolytic streptococci are recovered from the throat, because virus type infection will occur frequently in individuals who were previously nasopharyngeal carriers of these organisms. Such persons are always present in any population and may become very numerous under certain circumstances. The magnitude of this group and the accompanying diagnostic difficulties will vary with the geographic area, epidemic state of the community, and the skill and experience of the examining physician.

The disease had a variable course, as was to be expected.¹⁰ The temperature rose to 102° F. or more in 63.3 per cent, and remained elevated for not more than three days in 71.0 per cent of all cases. All physical signs had disappeared from the throat and neck within four days in 68.2 per cent of the same group of cases. A prolonged febrile course was usually associated with the presence of a skin rash, of an unusually severe suppurative process in the throat, or a suppurative complication. The early supervention of a nonsuppurative complication prolonged the period of disability in a few patients.

A variety of therapeutic regimes involving the administration of varying amounts of penicillin, alone or in combination with sulfadiazine, or the latter drug alone, were instituted.¹⁵ The number of cases in each treatment group was not large and no true controls were available since the most severely ill patients usually received antibacterial therapy. The evidence indicates that none of the several regimes sharply terminated the febrile illness, induced a dramatic resolution of the suppurative lesion in the throat, nor led to an unusually rapid return to normal of the various laboratory tests. It is possible that suppurative complications were prevented in certain cases but this may only be inferred.

The natural history of Group A hemolytic streptococcus sore throat caused by each of six serological types was analyzed and compared.¹¹ Biological differences existed between strains of the various types. In spite of this fact, the signs and symptoms of the initial phase of the infection, its course, and the degree of abnormality of the various laboratory tests were similar regard-

less of the type of the etiological agent. Infection by four of the types (3, 17, 19, and 30) was associated with a skin rash in certain persons and the febrile course of the illness was, under these circumstances, more prolonged.

The information obtained during this study permits a description of the first three weeks of the Group A hemolytic streptococcal carrier state in young adults.¹¹ The organisms were isolated from the pharynges of 99 per cent, and from the noses of 65 per cent of these cases at the onset of the illness. One week later 75 per cent were proved to be pharyngeal, and 28 per cent nasal, carriers. Only a very slight diminution in the number of carriers occurred during a subsequent two weeks' period of observation. A persistent pharyngeal carrier state was established less often in persons in whom the tonsils had been removed. The absence of these organs had no effect on the occurrence of nasal carriers.

Persons harboring hemolytic streptococci in the upper air passages, particularly the nose, often transmit these organisms to susceptible human beings. It is worthwhile, therefore, to emphasize the fact that a large number of these infected men became persistent pharyngeal and nasal carriers, and that none of the antibacterial therapeutic regimes was effective in eliminating the organism from the throat and nose.

Suppurative Complications. Complications resulting from the direct extension of the hemolytic streptococcus to areas contiguous with the pharynx were uncommon. Five men developed otitis media and four developed peritonsillar abscess. The recovery of a few other men was delayed by the presence of an unusually severe suppuration in the pharynx which did not proceed to abscess formation. This fortunate result may well have been the result of the use of adequate chemotherapy. A period of prolonged disability was definitely or probably the result of acute suppurative sinusitis in 12 cases.

Nonsuppurative Complications—The Poststreptococcal State. During the course of this investigation it became apparent that the convalescence of a considerable number of men suffering from hemolytic streptococcal respiratory disease was marred by the appearance of complicating disorders that were not the result of the extension of the infectious process to contiguous or remote organs and tissues. Such nonsuppurative complications occurred in approximately 20 per cent of the 299 cases in which intensive studies were carried out.¹²

The frequency of occurrence of the various late complications is presented in the table on the following page.

Arthritis of varying degrees of severity was the most common type of late nonsuppurative complication. Involvement of the joints was associated in certain cases with fever, and clinical and/or electrocardiographic evidence indicating the presence of a carditis. Such cases were then indistinguishable from classical rheumatic fever.

Fever or carditis were often absent. Demonstrable involvement of the heart was more likely to occur in febrile patients. The febrile and arthritic phases of this poststreptococcal disorder were nearly always terminated by the administration of salicylates but final recovery was delayed, the erythrocyte sedimentation rate having remained elevated in every case for more than 30 days.

examples of a related nonsuppurative process. Similar cases have been observed by others following hemolytic streptococcal sore throat in military personnel.⁶ Certain other cases were observed in whom complications followed streptococcal infection that were not clearly related to those enumerated above. Several men developed enlargement of the

The Poststreptococcal State—Frequency of Occurrence of the Various Late Complications

Total Cases	Arthritis		Late Fever		Carditis	Pneumonitis		Late	
	With Carditis*	Without Carditis	With Carditis*	Without Carditis		With Carditis*	Without Carditis	Lymphadenitis	Other
299	9	10	6	9	11	1	2	8	17

* Abnormal electrocardiogram.

The convalescence of another group of patients, nearly as large as that just described, was complicated by a recrudescence of fever, after a period of normal temperature following the initial respiratory illness, of from five to nineteen days in duration. Evidence of carditis in the form of abnormal electrocardiograms was discovered in more than one-third of these cases. This febrile disease, except for the absence of joint involvement, closely resembled the arthritic poststreptococcal disorder just described but there were important differences as well as similarities between the two groups of cases. The complication appeared earlier, was less severe as estimated by the height of fever, degree of abnormality of the erythrocyte sedimentation rate and electrocardiogram, and was of shorter duration.

Abnormalities of the electrocardiogram were discovered in another group of patients during convalescence from the initial streptococcal infection in whom fever, arthritis, or other clinical evidence of disease were absent. The erythrocyte sedimentation rate was elevated in all of these cases when evidence of carditis was first discovered and usually remained so for three or more weeks.

Involvement of the heart valves was not definitely recognized in any of the patients in the three categories just described during the relatively brief period of follow-up study that was available, nor was there clinical evidence of acute carditis in any except a few of the arthritic cases. This may have been the result of the prolonged hospitalization of most of the cases during the period of intensive study. Others have described cardiac pain, gallop rhythm, enlargement of the heart, and collapse in similar cases subjected to more strenuous activity.¹⁴

Three cases were studied that were of the greatest interest, since a febrile disease associated with Roentgen evidence of pneumonitis appeared during the poststreptococcal period. These cases would probably have been regarded as examples of primary atypical pneumonia if the initial streptococcal illness had not been observed and follow-up studies instituted. Pneumonitis has long been recognized as a part of the syndrome of "rheumatic fever." It is suggested that these examples of nonarthritic poststreptococcal pneumonia are

cervical lymph glands with tenderness while convalescent from the initial infection. In certain cases this seemed to be caused by a delayed extension of the suppuration in the throat and, in others, was definitely the result of reinfection by a new type of hemolytic streptococcus. In the latter event lymphadenitis appeared in the absence of the usual pharyngeal signs of streptococcal infection. There were a few patients in whom neither of these mechanisms could be established as the cause of late lymphadenitis and fever. However, the disease was different from the other nonsuppurative complications described above and may have another pathogenesis because the erythrocyte sedimentation rate was usually normal during the height of the glandular involvement and later and abnormalities of the electrocardiogram were never discovered.

Nonthrombocytopenic purpura, which may have been the result of the preceding streptococcal infection, occurred in two patients. A decision as to the etiology of this complication cannot be made. Glomerulonephritis was not recognized as a sequel to hemolytic streptococcal infection during this study.

The initial sore throat was complicated by a prolonged febrile course which could not be explained on the basis of any discovered continuing suppuration in five cases. Electrocardiographic abnormalities were present in four of these. It may be that the prolonged disease in these men was the result of hidden suppuration and the alterations in the electrocardiogram those which have been previously described in febrile individuals. It is not improbable that the early supervision of a nonsuppurative disorder similar to those described earlier had occurred but this hypothesis cannot be definitely established.

The treatment of the acute phase of hemolytic streptococcal sore throat by the administration of large amounts of sodium salicylate, a short course of penicillin alone or followed by a sulfonamide, or the use of the latter drug alone, did not prevent the development of late nonsuppurative complications. Poststreptococcal disorders were not observed in a group of men who received 500,000 to 1,000,000 units of penicillin in 80 hours, but these results are not convincing since the number of cases so treated was small.

All of these disorders, initiated by hemolytic streptococcal infection with or without arthritis or carditis, are believed to be manifestations of the same pathological processes. The suggestion was made that all of these disturbances be grouped together and regarded as phases of the "post-streptococcal state." This concept states the essential streptococcal etiology of rheumatic fever, adequately emphasizes nonarthritic poststreptococcal continuing disease as a potential cause of valvular heart disease, and simplifies the clinical consideration of the various manifestations of these conditions.

PATHOGENESIS OF NONSUPPURATIVE COMPLICATIONS

The mechanisms by which hemolytic streptococcal infection incites the development of the late nonsuppurative complications can not be elucidated at the present time. The most widely accepted theory states that the pathogenesis of these disorders is based upon an immunological phenomenon. It is believed that the development of hypersensitivity to the Group A hemolytic streptococcus or some fraction or product thereof leads to the appearance of the pathological processes described above. Repeated clinical or inapparent infection by these organisms may be essential for the establishment of the hypersensitive state.

Infection by organisms other than the hemolytic streptococcus occasionally is followed by the appearance of late complications that may have a similar pathogenesis. Most notable is the sterile type of gonococcal arthritis. There is also a group of diseases, including disseminated lupus erythematosus, periarteritis nodosa and, possibly, rheumatoid arthritis, that bear clinical resemblance to the various poststreptococcal complications and which may also be the result of sensitization to as yet unrecognized substances or infectious agents. Evidence has not been presented which demonstrates that rheumatic fever and the closely related progressive disorders leading to chronic valvular heart disease may be initiated by nonstreptococcal infection. It is probable that the hemolytic streptococcus is not only a highly active sensitizing agent of wide spread occurrence in nature, but that it also incites a form of hypersensitivity with a course different from that induced by other agents.

PREVENTION OF NONSUPPURATIVE COMPLICATIONS

The prevention or control of the serious late nonsuppurative complications of hemolytic streptococcal respiratory disease present problems of the greatest importance. Little progress has unfortunately been made toward their solution. Several different lines of approach are available which may be summarized. It should be borne in mind that none had been adequately explored.

1. The prevention of hemolytic streptococcal infection. For several reasons, some of which will be stated below, control of nonsuppurative complications of streptococcal disease will remain

difficult and incomplete until infection by these organisms can be eradicated. The problems involved in the accomplishment of this goal are many and have been previously reviewed.¹³

It is clear that ordinary public health measures, which have been so effective in the control of enteric disease, cannot be utilized for the purpose of eliminating the dissemination of respiratory pathogens such as the hemolytic streptococcus. Therefore, the resistance of the individual human being to infection must be increased. Potentially, this may be accomplished by immunological or chemical means. The possibilities of immunization against streptococcal infection have barely been explored and are fraught with many difficulties.

Chemoprophylaxis using sulfonamides is possible on a limited scale in selected persons. The toxicity of these agents and the tendency of streptococci to become resistant to their action prevents their widespread use by the population at large. As yet, no more suitable chemical for the prevention of streptococcal disease in large groups of human beings is available.

2. Prevention of complications. Because it is unlikely that a technique for the eradication of hemolytic streptococcal infection will become available in the near future, it is imperative that investigation be carried out which will establish the pathogenesis of the late complications and provide means for their prevention after infection has occurred. It is possible that immunological procedures could be devised which, if initiated before or at the time of the initial acute respiratory infection, would prevent the later development of serious hypersensitivity. Perhaps more likely is the discovery of a chemical, the administration of which through the latent period would block the reaction which leads to the development of the phenomena of the poststreptococcal state. The use of large amounts of salicylate throughout this interval has been stated to prevent recrudescence of rheumatic fever in susceptible persons following hemolytic streptococcal infection.² This important observation has not been adequately confirmed.

The discovery if immuno- or chemotherapeutic procedures of the type just described will not, unfortunately, greatly decrease the frequency of occurrence of poststreptococcal nonsuppurative disease, since their application involves recognition of the initiating acute respiratory illness and the establishment of its correct etiology.

Because streptococcal sore throat is frequently mild, many patients will not consult physicians until the late complications have appeared. Approximately one-half of all cases of rheumatic fever admitted to the hospital during the study described in this paper had not been sufficiently ill as a result of the precipitating sore throat to report on sick call. The disease will be atypical in others and will be regarded as an ordinary "virus type" infection, and prophylactic therapy will not be instituted even though medical care is available throughout the initial illness.

TREATMENT

The treatment of acute streptococcal sore throat is unsatisfactory. The use of a sulfonamide or penicillin during the initial illness may well prevent the extension of the infection from the throat and reduce the frequency of occurrence of suppurative complications. Neither agent has been shown to alter greatly the severity or duration of the initial illness. If penicillin is used, it must be administered for at least five days in a dosage of 100,000 units per day or more. An inadequate, shorter course of therapy will be followed by clinical relapse of the acute symptoms in a considerable number of cases.

No therapeutic measures presently available have been proved to be capable of terminating nonsuppurative poststreptococcal disease. The administration of large amounts of a salicylate (5 to 10 grams per day) will usually be followed by a return of the temperature to normal and an abatement of arthritis if present. Satisfactory proof has never been obtained to show that such a regime shortens the total duration of illness or decreases the frequency of cardiac complications. The effect of the salicylate drugs on the rheumatic state is sufficiently dramatic to indicate their use in every case unless serious toxicity is encountered.

Future study along lines indicated in the section on prevention may well lead to immuno- or chemotherapeutic techniques for the treatment of the disorders of the poststreptococcal state. Unless improved methods for the recognition of the nonarthritic nonsuppurative complications are developed, the availability of such therapeutic tools will be less valuable because a large number of cases of poststreptococcal disease will remain unrecognized. This problem is emphasized by the large number of persons who appear in any clinic in whom well established chronic valvular heart disease is present but from whom no history of rheumatic fever or a related disorder may be obtained.

CONCLUSION

Hemolytic streptococcal sore throat is a serious and exceedingly common disease which causes much disability as the result of the initial acute respiratory illness. More important are the arthritic and nonarthritic nonsuppurative complications which are frequent sequellae. Research in progress in many laboratories at the present time

may well establish the pathogenesis of these disorders and techniques for their prevention or treatment. It is improbable that such measures will greatly reduce the total frequency of chronic valvular heart disease, although they will be of great importance to the individual patient suffering from a poststreptococcal complication.

The ultimate goal of future investigation must be the eradication of infection of human beings by hemolytic streptococci.

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Treatment of Diseases of Virus Origin*

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THIS brief résumé of principles in the treatment of diseases of virus origin will also include some recent experimental studies and examples of clinical application. For a better understanding of the principles we shall broaden the term "treatment" to comprise modification or attenuation of virus diseases during the incubation period and in the prodromal phase.

After entering the host a virus may come into immediate contact with susceptible cells, as in the air-borne respiratory diseases; or there may follow a period of invasion varying from a few days to several months, during which the infectious agent travels to susceptible tissues by way of the gastrointestinal tract, the circulation, the lymphatics, or the neurons. In this phase we may attempt by immunological, biological, or chemical means to neutralize or inactivate the extracellular virus, or block its access to the cells where it is going to multiply. Viruses, growing as they do inside of cells, seem to be particularly invulnerable to the action of antibodies or chemical inhibitors, but it is possible that in certain instances a chemotherapeutic agent may pass through the cell membrane and inhibit the virus either directly or by action on the host cell. The latter effect would presumably involve modification of the enzymatic processes of the infected cell so as to make it an unfavorable medium for multiplication of the virus.^{18, 19, 27, 28} Correlative to this is the observation that certain nutritional deficiencies do not increase the susceptibility, but do increase the resistance, of experimental animals to poliomyelitis and some other virus diseases.^{14, 28}

In certain virus diseases the infectious agent, after reaching an advanced stage of growth, destroys the cells in which it is multiplying and spreads to a fresh group of susceptible cells. During this phase the virus is at least momentarily extracellular and again exposed to the action of antibodies or chemotherapeutic agents. But after symptoms have developed in many acute diseases of virus origin there seems to be little hope for a specific therapy aimed at prevention of the distribution of virus. By that time most of the cells that are to be infected have been entered by the virus, or the mechanisms for tissue damage have been set in motion.³³

The production of passive immunity by injection of human convalescent serum, placental extract, or hyperimmune animal sera has been tried in many virus diseases with varying results. The recent studies at Harvard by Dr. Cohn and others on the fractionation of human plasma have resulted in the production of partially purified preparations in which the antibodies against certain viruses are concentrated fifteen to thirty fold

in the gamma globulin fraction^{3, 9} as compared with the whole plasma.

Gamma globulin is effective in prevention and attenuation of measles presumably by specific neutralization of circulating virus.³³ Convalescent serum in large amounts of 50 cc. intravenously has been reported to have therapeutic value immediately after the appearance of Koplik spots,²² and concentrated gamma globulin used similarly is said to modify the disease if injected soon after the onset of measles.³⁸ The prevention of mumps orchitis by the use of gamma globulin from pooled convalescent plasma has been partially successful when the globulin was given in large doses within 24 hours of the onset of parotitis.¹⁵

In three epidemics of infections hepatitis^{16, 39} gamma globulin in amounts of 10 cc. given parenterally during the incubation period, which is about 30 days, apparently prevented or attenuated the disease. The available evidence suggested, however, that this form of treatment administered during the last week of the incubation period or after the development of the first symptoms suggestive of hepatitis did not modify the disease.

Hyperimmune rabbit serum has been used in the treatment of rickettsial diseases. In experimental animals therapeutic effectiveness against Rocky Mountain spotted fever was demonstrated when the serum was given as late as 120 hours after infection or in the second day of fever, and complete suppression of the disease could be obtained with small doses given within 24 hours after infection. In 52 human cases treated before the third day of rash the fatality rate was 3.8 per cent as compared with the expected rate of 18.8 per cent.⁴³ In human epidemic typhus, hyperimmune rabbit serum given within the first three days of fever is reported to have some therapeutic effect.⁴⁵ On the basis of this and other evidence the rickettsial diseases seem to belong in the category of illnesses where cell-to-cell spread of the infectious agent continues after symptoms have appeared.

By contrast, in influenza and virus pneumonia the therapeutic or prophylactic value of convalescent or immune serum given intravenously, intramuscularly, or by inhalation has not been established despite some promising results on protection of mice against influenza by inhalation of immune serum. Recent clinical trials of gamma globulin in preparalytic poliomyelitis have yielded negative results.²

Although there are at present no clinical applications, mention should be made of the phenomenon of virus interference. Repeated laboratory observations by many workers have shown that inoculation of an animal with one virus, which may be attenuated or even inactive, will afford al-

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most immediate but temporary protection against subsequent infection by a virulent virus having the same tissue tropism.²⁵ Recently a significant example of this phenomenon of cell-blockade has been reported with canine distemper in foxes.¹⁷ When the attenuated virus was given intramuscularly 3 to 12 days after intranasal infection with the virulent virus, but before the development of symptoms, it prevented death of the animals from a disease which killed 100 per cent of the controls. Conceivably the principle of interference might be applied in a similar way to other diseases where the virus enters the body by way of the respiratory or gastrointestinal tracts. Its access to susceptible cells might be blocked by injecting into the circulation an avirulent, but not necessarily antigenically related, virus.

The sulfa drugs and penicillin have no effect on experimental infections with such viruses as influenza, yellow fever, poliomyelitis, encephalitis, herpes, and vaccinia*. On the other hand, infections with agents of the psittacosis-lymphogranuloma group and certain of the pathogenic rickettsiae do respond to chemotherapy.

The inhibitory action of sulfanilamide derivatives in clinical lymphopathia venereum is well known. Sulfa drugs also show chemotherapeutic activity in trachoma and inclusion blennorrhoea^{31, 32} which are presumably caused by viruses belonging to the same group. These drugs are active in experimental infections with certain strains of psittacosis virus^{6, 26} and are very effective against the related elementary-body virus of mouse pneumonitis.⁸ In considering the action of sulfa drugs on viruses of the psittacosis-lymphogranuloma group we should note that many of these infections are prolonged, chronic, or characterized by a carrier state, with repeated spread of the virus from one cell to another, and that chemotherapy probably does not completely abolish the infection. A substance** closely related to sulfanilamide has chemotherapeutic activity in experimental typhus infections of mice, but shows no activity in guinea pigs.¹ Certain sulfonamide drugs actually seem to have a deleterious effect in experimental typhus.⁴⁰

Penicillin is inhibitory to most viruses of the psittacosis-lymphogranuloma group^{6, 20, 26, 29} in mice infected by the respiratory or intraperitoneal routes and in chick embryos infected by the yolk-sac route. The dosage of penicillin required for definite inhibition varies from a relatively small quantity to enormous amounts, depending on the strain of virus, the host, and the experimental conditions. Clinical studies on the effectiveness of penicillin in human psittacosis have been made by several investigators^{12, 44} and the results in a small number of cases seem to have been favorable. As with the sulfa drugs, penicillin inhibits, but seldom, if ever, completely inactivates the

virus *in vivo*. Penicillin has been found to inhibit experimental murine typhus infections of mice and chick embryos^{18, 19, 27} but clinical trial in human louse-borne typhus has given inconclusive results.⁴⁶

Streptomycin shows no activity against experimental infections with influenza¹³ and viruses of the psittacosis group.⁶ The search for other antibiotics active against virus infections has so far been unsuccessful.²¹

Other drugs which show little activity against bacterial infections apparently have some chemotherapeutic value in rickettsial diseases. Para-aminobenzoic acid, a biochemical antagonist of sulfanilamide, has been tried with apparent benefit in 20 cases of louse-borne typhus fever.⁴⁶ When treatment was started in the first week of the disease the clinical course of the patients who received para-aminobenzoic acid was much less severe, and the average duration of fever considerably shorter than of those of the control group. In the laboratory this substance has been found by a number of investigators to be active against experimental infections with scrub typhus, murine typhus, epidemic typhus, and Rocky Mountain spotted fever.^{34, 47} Treatment of only one human case of the latter disease has been reported. Therapeutic value in scrub typhus has been recently ascribed to para-aminobenzoic acid.⁴² Two other substances of quite unrelated structure have been found to possess therapeutic activity in experimental infection of mice with murine typhus³⁰ and possibly also in scrub typhus. One of these is toluidine blue, and certain other thionin dyes also have rickettsiostatic activity. The other compound is forbisen, which is also an antimalarial drug.

Secondary bacterial infections probably occur as complications of many virus diseases, and chemotherapy is often used in such bacterial infections when they are recognizable. Of especial interest in this connection are the respiratory diseases. The association of *Hemophilus influenzae* and influenza virus in swine influenza is a classical example of the synergistic action of a bacterium and virus in producing a disease far more severe than that caused by the virus alone.³⁵ Pneumococcal and staphylococcal pneumonias may accompany or follow virus influenza in man^{10, 40} but fatal cases of influenza A with myocarditis and bacteriologically sterile pneumonitis have also been reported.¹¹ In recent epidemics of influenza the incidence of pneumonia has generally been low, and adequate data on the effectiveness of chemotherapy on the associated bacterial infections are not available. In the causation of primary atypical pneumonia the possible association of a non-hemolytic or indifferent streptococcus^{5, 41} with a virus⁷ has been postulated. Laboratory observations indicate that the virus is not inhibited by penicillin. The streptococcus, however, is moderately susceptible to this drug, but not to sulfonamides. If the streptococcus is actually a factor increasing the severity in some cases of this disease, then a beneficial effect of penicillin might be expected. Clinical

* Reviews of the literature will be found in references 21, 24, 28, 33. Sprunt³⁷ has reported slight inhibition of vaccinia in the skin of rabbits injected subcutaneously with methionine, betaine, or choline.

** Sulfonamidobenzamidine.

reports on the treatment of primary atypical pneumonia with penicillin are conflicting^{4,36} at present.

CONCLUSION

Modification of several virus diseases has been accomplished by treatment during the incubation period. Chemotherapy has been successful only in diseases caused by the rickettsiae and the largest known viruses, those of the psittacosis-lymphogranuloma group. The group of drugs found to be active against the rickettsiae are not identical with those which are effective against bacterial infections. In virus diseases, particularly in respiratory diseases, further laboratory and clinical investigation of synergistic or secondary bacterial infection in relation to chemotherapy is warranted by the data now available.

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TROPICAL ACNE*

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THE term "Tropical Acne" arose during the war to describe those cases of acne vulgaris which were seen so frequently in the military personnel serving in the hot climates. This condition differs in many respects from that of the acne vulgaris that is seen in a temperate zone. Its onset is more abrupt and it is usually more severe. The individual lesions are frequently of the cystic type so that deep-seated pustules develop, resulting in deep scarring. Cohen and Pfaff³ felt that the degree of scarring in many cases at the end of eight to ten months corresponded to that seen in temperate climates at the end of five to ten years. Many of these cases were so severe that the men had to be sent back to the States.

During 1945 I was stationed at the United States Naval Receiving Hospital, San Francisco, which took care of nearly all the Navy patients coming in from overseas to that port. There I had the opportunity of observing a large number of dermatological cases coming from the Pacific.

It is interesting to note that of the total number of patients received, 7.75 per cent were dermatological patients. Considering only the medical patients, with the surgical and the neuropsychiatric cases excluded, the dermatological percentage increased to 24.53 per cent.

The importance of tropical acne is shown by the fact that in the four months from July through October, 1945, tropical acne accounted for 28.5 per cent of all dermatological cases. The only condition with a higher incidence was fungus infection which made up 29.4 per cent of the total. Thus it can be readily seen that tropical acne was a most important cause for military dermatological disability.

This incidence of the disease corresponds with the findings of Duemling⁴ who had a similar experience at the United States Naval Hospital, San Diego. Sulzberger,⁵ while stationed at Guam, also placed tropical acne as the second most important dermatosis, prickly heat being the first.

Because of the frequency and the severity of this disease it seemed worth while to determine, if possible, some of the underlying etiological factors concerning its development. Histories and physical examinations were done on 100 consecutive patients with tropical acne who had been returned to the United States from the tropics because of this condition.

It was found that the average age of this group was 22.75 years, which is a little older than the acne age noted in civilian life. Eleven were over 30 years of age and one of these was 41 years old. Of this older group, all gave the history that they had not been bothered with their acne for years until going overseas.

RELATIONSHIP TO PREVIOUS ACNE

All but two of the group stated that they had formerly had acne. One of the patients who had not had previous acne was 26 years of age, with duty ashore as a tractor operator. He began to develop this disease almost immediately on going overseas and had an involvement of the back. The other, a gunner, was 20 years of age and he had developed his acne after four months overseas. The area most severely involved in this case was the buttocks.

The average age at which the previous acne started was 15.8 years. Most of the patients gave a history that this was mild, consisting of comedones which had not bothered them to any extent. Frequently they denied having had acne until they were asked if they had had "blackheads and pimples." Their present disease was

* Read before the Section on Dermatology and Syphilology, at the Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

so much more severe and disfiguring that it did not seem related to their previous acne.

Eighty-two gave a history of involvement of the face. In the remaining, the other sites were: neck, in eight cases, back, in six cases, and the chest in two. As stated above, two gave no previous history of acne. This is a marked contrast, as will be shown later, to the distribution of tropical acne.

INCUBATION PERIOD

Of this group of 100 patients, the time overseas varied from three months to 35 months, giving an average time of 14.39 months. Nine stated that they had had activity of their acne before going overseas. Fifty-three began having trouble in two months and all but ten developed the disease before six months. In general, the course of the disease was progressive and as long as the patients stayed in the tropics new lesions continued to develop and local therapy of various kinds was of little avail.

Many stated that they noticed considerable improvement in the last few days aboard ship after coming into a cooler climate. This was further substantiated during the patients' short stay at the hospital before being shipped elsewhere. Many would improve remarkably without any specific therapy. This was probably due to cooler climate and more frequent bathing.

SITES OF INVOLVEMENT OF TROPICAL ACNE

The cases were roughly divided into three groups according to their severity: mild, moderately severe, severe. The mild cases were those with scattered lesions which did not interfere with the carrying on of duty. The severe cases were those with many deep cystic and pustular lesions in which the extent of involvement interfered with the patient's ability to carry on. The moderately severe group were in between.

Chart I shows that 84 had involvement of the back. The chest and neck were next most frequently involved. The face had activity in only 28. This is in marked contrast to the history of previous acne in which 82 had had the face involved. In relation to this difference between the

CHART I.—Distribution of Lesions in 100 Cases of Tropical Acne.

Affected Area	Mild	Moderate	Severe	Total
Back	21	37	26	84
Chest	10	20	24	54
Neck	10	22	17	49
Face	5	11	12	28
Buttocks	3	3	4	10
Shoulders	2	5	2	9
Arms	1	5	3	9
Legs and thighs	1	0	3	4

sites of activity of juvenile acne and tropical acne, it was frequently noticed that the sites of the old acne were not exacerbated and frequently were clear while new areas showed extensive involvement. For example, a patient would have scars on his face and a few comedones of his previous acne while his shoulders and back would be covered with deep cystic, pustular and granu-
lomatous lesions.

TYPE OF DUTY

In attempting to determine what factors play a role in this disease, the kind of work performed is most important. It is generally believed that hot and greasy occupations are predisposing causes of acne. It should be mentioned here that tropical acne does not resemble the oil acne and chloracne of industry which involves, for the most part, the arms and legs and is due to the presence of some irritating substance.

It was found that out of this group of 100, 42 had duty aboard ship and 58 duty ashore. Of the group aboard ship, 37 per cent were on general detail above decks which, for the most part, is clean duty. In addition, there were others working as radio operators, in small boat crews, etc., who could also be classified as having clean duty. There were only two machinists and one cook in the entire group.

Of the 58 based ashore, 21 had duties which could be considered dirty; namely, motor drivers, machinists and stevedores. The others had "clean" duty, working as guards, mailmen, pharmacists' mates and communicators. Thus it appears obvious that the duties in themselves were not primary factors in the development of acne.

CLOTHING

There has been some discussion as to what part clothing plays in precipitating acne in the tropics. As has been noted, this form of acne is common on the normally covered parts; namely the back and shoulders. Some have felt that going without shirts and excessive exposure to the sun might explain the disease in part. Others have thought that the wearing of shirts in the tropics was detrimental because it did not allow tanning to take place which should help control the disease and that the rubbing of the shirt on the perspiring skin would cause irritation and result in the formation of pustules.

For these reasons, 36 patients were questioned about the wearing of shirts: It was found that 21, or 58 per cent, did not wear them most of the time, while 15, or 41 per cent, did. It is my impression that these percentages were about the same as those seen among the entire personnel and it does not appear that either the wearing or not wearing of shirts has any relationship to the development of tropical acne.

BLOOD CHLORIDES

It has been suggested by Carpenter¹ that the excessive heat might cause a disturbance of blood chlorides which might be a factor in the causation of tropical acne. For this reason determinations of blood chlorides on 50 consecutive cases were done as soon as possible after arrival in this country. As controls, 50 neuropsychiatric patients with clear skin were used. These were chosen, as much as possible, from the same incoming draft as the acne patients so that all would have experienced approximately the same climatic conditions. Blood chlorides were deter-

mined by the Whitchorn method.² Chart II shows there was no significant difference between the two groups.

CHART II. - Blood Chloride Determinations.

	Average Time Overseas	Blood Chlorides—Mg. per 100 cc.		
		Average	Highest	Lowest
Acne patients	14.39 mo.	460.52	594	346
Controls	18.64 mo.	468.53	594	346

COMMENT

In the 100 cases of tropical acne studied there is only one common factor which stands out as the primary cause for the development of the disease, and that is excessive heat. It seems reasonable to assume that, with the terrific heat, the sebaceous glands are over-stimulated, resulting in plugging of the ducts leading to comedone formation and, secondarily, to cysts and pustules. It is generally thought that prickly heat is developed on the basis of over-activity of the sweat glands.

When one considers other possibilities, such as diet, it should be remembered that for the most part the armed forces had an adequate, well balanced diet and that the food aboard ship and in established naval bases was ample in regard to fresh vegetables and meat.

It has been shown in the article that the type of duty played no significant role and those performing all types of work were afflicted. Interestingly enough, most of the men had what would be described as clean duty and those doing excessively hot and oily jobs were in the minority.

Lowering of blood chlorides from excessive heat was not found in those suffering from the disease, as all of the determinations were found to be within normal limits.

The length of time overseas appears to be unimportant in itself as over three-quarters of the patients developed their acne within the first six months, suggesting an individual susceptibility rather than duration of exposure to tropical climate.

The question of bathing facilities naturally arises. For the most part, in the Navy, it was well taken care of. Those aboard ship had access to good bathing facilities, as did those at shore bases after they had once been established. Of course, this was not true in the front lines, but most of these cases were not performing that type of duty.

SUMMARY

Tropical acne is a common, severe skin disease accounting for 28.5 per cent of the dermatological cases sent home from overseas.

It was nearly always seen in those having suffered from previous, usually mild, acne vulgaris. It differs from acne vulgaris of the temperate zones in its rapid development, and it is of a deep cystic, indurated type which leaves mutilating scarring of the affected areas. Tropical acne is seen most frequently on the back, shoulders and neck, whereas the usual acne vulgaris most commonly involves the face.

Excessive heat which over-stimulates the seba-

ceous glands appears to be the chief factor in the development of tropical acne.

The recent war has shown that those suffering from acne vulgaris should not be sent to the tropics because, with many, the disease is aggravated and severe scarring results.

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Discussion by COMDR. W. W. DUEMLING*

I feel it a privilege to be permitted to open the discussion of this paper, which brings before us one of the major dermatologic problems of the past war. As has been pointed out, in warfare fought over the jungle terrain of the islands of the South Pacific, where man must often be his own pack animal, the presence of cystic nodules and draining sinuses of the neck, upper back and shoulders, seriously affected his fighting efficiency and necessitated his evacuation to the States for treatment and disposition.

As Dr. Novy has shown in the series of cases which he studied, almost all these men had had a mild acne beginning in adolescence; so mild that they never consulted a physician for treatment. However, coincident with their arrival in the tropics, the lesions progressed rapidly, undoubtedly because of the increased activity of the sebaceous glands and the conditions of heat and humidity which favor bacterial growth. It was comparable to placing these men in a favorable medium in an incubator, and the results were as Dr. Novy has just shown us.

In relation to Dr. Novy, we at the San Diego Naval Hospital were at the end of the line, and large numbers of these men were transferred to our hospital for treatment and disposition. The peak of their numbers reached us in late 1943 and 1944 and at that time Admiral Chester M. Nimitz was quite unhappy with the physical quality of the manpower making up his fighting machine and directed that these men not be returned to the tropics. Acting on this directive, I released via medical discharge such a large number that my commanding officer was quite disturbed and asked to see these patients because he could not conceive of acne (which in his conception amounted to a few adolescent pimples) being a disabling condition. When he saw them he was amazed at the extent of the eruption and the disfiguring scarring.

Since our problem was to return these men to duty or civilian life, I would like to make a few remarks about the therapy of these cases. With such large numbers of patients to treat, we adopted a routine consisting of daily bathing, followed by evacuation of the superficial pustules and comedones, and the application of Lassars paste containing 2 per cent resorcin and 10 per cent precipitated sulphur. A high percentage of the mild cases were entirely controlled with this procedure. An excellent adjuvant used in all cases was electrodesiccation of comedones and superficial pustules. In a few days the crusts came away, and the involution process was speeded up materially. This can be recommended most highly.

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In the more severe cases dietary restrictions were imposed, and the use of penicillin both intramuscularly and as a local infiltration in and around the larger indolent nodules was resorted to, with striking improvement. It was noted, however, that relapses were likely to occur if the penicillin therapy was discontinued too soon. We could see no particular benefit from the use of intravenous saline as advocated by Carpenter.

In large, recurrent cystic nodules of the neck and face we resorted to exteriorization or saucerization previously described by me.⁴ Briefly this consisted of removal of the roof of the cyst, packing the cavity with iodoform gauze and allowing the base to heal over, resulting in a smooth, flat scar, rather than the rolled up or puckered scar seen as a sequel to multiple attempts at incision and drainage.

Discussion by H. V. ALLINGTON, M.D., *Oakland*

I am sure that all of us who observed service personnel in or recently returned from tropical areas agree

that "tropical acne" is a severe and often disabling skin disease. Dr. Novy's careful analysis of patients returning from the Pacific theatre shows how important this condition was during the recent war.

The fact that 98 per cent of his patients gave a history of acne vulgaris prior to going to the tropics suggests that in spite of the difference noted in this paper "tropical acne" is acne vulgaris modified slightly and in a severer form.

I believe that the type of skin one inherits, with particular reference to the character of the pilo-sebaceous apparatus, is the major factor in determining whether or not he will develop acne vulgaris. Dr. Novy's data tend to rule out diet, type of duty, clothing, cleansing facilities, and altered blood chlorides as causes of the exacerbation of acne in the tropics. I agree with him that heat and humidity resulting in further dysfunction of the sebaceous gland apparatus is the chief cause of acne vulgaris' assuming its tropical form.

Some Fundamentals in Estrogen Therapy*

S. CHARLES FREED, M.D., *San Francisco*

IN recent years the development of estrogen therapy has proven so satisfactory that it now ranks as one of the most valuable therapeutic procedures in endocrinology. The indications for estrogens are definite and clear-cut and their application is quite wide. Large numbers of women in the menopause, for instance, have obtained gratifying relief from their distressing symptoms. Not only are the typical symptoms of the menopause alleviated by this specific therapy, but considerable aid is obtained in the treatment of the allied functional disorders.

The physician today has a wealth of estrogenic products from which to choose, including synthetic products which offer unlimited dosage at reasonable expense. The most useful estrogens are those which are administered by mouth and by injection. Other methods of administration, such as sublingual or percutaneous, are of lesser importance.

In choosing between oral and injectable preparations certain factors should be analyzed. Oral administration is useful where frequent dosage is required such as in amenorrhea where the pelvic tissues require a rapid stimulus to growth, in the suppression of lactation where intensive daily treatment is essential, in certain types of excessive uterine bleedings, in the resistant menopausal patient where the oral estrogen may supplement the parenteral ones, and in carcinoma of the prostate where likewise intensive treatment is desired. Oral administration is also valuable when small doses are sufficient to produce results, but where it is inconvenient for the patient to visit

the doctor's office over a long period of time. These conditions include the menopause, certain types of abnormal bleeding, especially in the premenopausal group, and in dysmenorrhea where small daily dosages are effective by suppressing ovulation, apparently an essential feature of functional dysmenorrhea.

Choice of the oral estrogens depends to a great extent upon the personal experience of the physician, since all of them are effective at the proper dosage level. The comparative potency of oral estrogens can be demonstrated by comparing them to a standard of 1 mg. of diethylstilbestrol. Then the dosages of the following estrogens are approximately equally as potent:

hexestrol	5 meg.
benzestrol	5 mg.
estrone	2 mg.
estradiol	2 mg.
estrone sulfate	2 mg.
ethinyl estradiol	0.1 mg.

Such a comparison is made on the basis of producing subjective relief in the menopausal patient under controlled conditions, and not by laboratory assay where there are extremely wide variations in results from different laboratories.¹ Diethylstilbestrol is probably the most toxic of these agents; the toxicity of all the others is approximately equal, amounting to about 50 per cent of that obtained with a similar therapeutic level of diethylstilbestrol. This toxicity, which produces nausea, vomiting, nervousness, dizziness, is dependent upon the rate of absorption of the estrogen and is not the result of any tissue damage. Physiologically, and often clinically, the side reactions are similar to those of early pregnancy where a high level of estrogen appears in the body tissues.²

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From the Department of Medicine, Mt. Zion Hospital, San Francisco.

Injectable estrogens likewise vary in potency and in quality of action. With these products, however, several other factors enter into the choice of estrogen. For example, it is now well known that these substances, like other drugs such as insulin, epinephrine, penicillin and pituitrin, are improved in efficiency when their absorption into the blood stream is delayed. The recent use of penicillin in oil is a typical improved agent. Estrogens, however, are delayed in their absorption by several methods, the most common being by combination with the fatty acids. The heavier the fatty acid the more prolonged the action and usually the better the therapeutic effect. Estrone cannot be combined to advantage with fatty acids. Estradiol coupled with benzoic acid in the form of estradiol benzoate is more effective than the free compound. Coupling with propionic acid in the form of estradiol dipropionate results in a superior product to the benzoate since the absorption is slower, the effect more prolonged and more efficient. A similar response is obtained with diethylstilbestrol. The free compound is less effective than diethylstilbestrol dipropionate which in turn is less effective than diethylstilbestrol dipalmitate. This is dramatically shown by our results which we have already reported, namely, that injections of diethylstilbestrol in dosages of 5 mg. once weekly for three weeks will give relief in the menopausal patient for an average of three weeks following cessation of treatment. A similar dosage of the dipropionate will induce a therapeutic effect for approximately five weeks under similar conditions while the dipalmitate has an effect lasting on the average of nine weeks and not uncommonly as long as 15 to 16 weeks.² Using the same principle of delayed absorption, however, we have been able to improve the efficiency of estrone by suspending this fat soluble substance in an aqueous medium, reversing the procedure of suspending water soluble substances such as penicillin in oil.³ The action of estrone in suspension is prolonged because the water vehicle is rapidly absorbed leaving a deposit of crystals in the tissues thus behaving like small implants of crystals which we know are relatively long acting. The same effect has recently been demonstrated by us with diethylstilbestrol crystals suspended in water.⁴ In addition this latter preparation is considerably less toxic than the same substance dissolved in oil because of the slower absorption into the blood stream. We may predict that many other endocrine products now dissolved in oil will eventually be suspended in water for injection purposes. As an example, we have recently shown that testosterone in crystalline form suspended in water is more effective than the similar substance dissolved in oil due to the enhanced efficiency of delayed absorption.⁵ In addition to the longer action of the aqueous suspensions over the oil solutions, we have the added advantage of freedom from local irritating and allergic reactions at the site of injection not un-

commonly found with many of the vegetable oil solvents.

In choosing the most desirable injectable estrogen we must again rely on our personal experience and our perspective regarding our aims and desired results. In the treatment of amenorrhea we believe that a rapidly acting estrogen is preferable, so that a prompt response is obtained in building up the atrophic uterine tissues and that with the cessation of injection there will be a more definite episode of withdrawal bleeding. In those cases where a more prolonged effect is desired, such as in dysmenorrhea where suppression of ovulation is essential, in certain abnormal functional bleedings and in the treatment of the menopausal syndrome, the longer acting estrogens will be found more desirable. These will include the esterified compounds of estradiol and diethylstilbestrol and the aqueous suspensions of estrone and diethylstilbestrol. In our experience the most powerful acting of the estrogens are estradiol dipropionate and diethylstilbestrol dipalmitate, these being approximately of equal potency. There is rarely encountered a menopausal patient whose symptoms do not respond to these agents at dosages of 5 mg. once every two weeks. The other estrogens are valuable where a lesser potency is sufficient and especially in maintaining the therapeutic effect after the initial results have been obtained.

Toxicity of injectable estrogens is of relatively little significance except in the case of diethylstilbestrol and its compounds. The free substance is extremely toxic when injected in dosages of 2 mg. or more. We have obtained an incidence of side reactions amounting to 40 per cent when dosages of 5 mg. per injection are employed. However, when a brake is applied to the speed of entry into the blood stream by combining with propionic acid, there is a marked drop in the incidence of untoward reactions, while with the dipalmitate practically no toxicity is encountered due to the extremely slow rate of absorption.²

If the principles of the action of estrogens are understood by the practitioner there will be less confusion in his mind as to the proper choice of estrogen for any one condition. His patients will benefit greatly from the more critical application of the estrogen and the physician in turn will be more highly gratified with his results.

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Diverticulum of the Anterior Urethra: Report of an Acquired Type*

HARRY A. ZIDE, M.D., *Los Angeles* AND MARVIN S. SIEGEL, M.D., *Brooklyn, N. Y.*

A DIVERTICULUM is defined as "a pouch or pocket leading from a main cavity or tube."¹ It may be either a true diverticulum, in which case all layers of the viscus are present, or a false diverticulum, in which only the epithelial lining is present. These definitions pertain to diverticula of the urethra as well. They may vary in size from a capacity of a few cubic centimeters to over one hundred cubic centimeters. Any portion of the urethra may be involved (Fig. 1) but it is usually the floor of the urethra

a. From dilatation of the urethra proximal to stricture or calculus.

b. From a false cavity formed after perforation of the urethral wall by injury or of a peri-urethral abscess into the urethra.

c. From the pathologic distension of a normal structure such as the sinus pocularis, prostatic and paraurethral ducts.

In some cases the inciting cause cannot be defined, with no difference, of course, as to the treatment.

ANATOMY, NORMAL AND ABNORMAL

The anterior urethra extends from the urethral meatus to the anterior layer of the triangular ligament. It runs in a cleft between the erectile bodies of the penis, the corpora cavernosa, and is surrounded by a semi-erectile sheath, the corpus spongiosum.⁴ The urethra is supplied by three sets of nerves, the sympathetic (hypogastric), the parasympathetic (pelvic), and the somatic (pudic). The nerve supply follows no definite pattern and both the muscles of urinary control and the urethral walls are supplied by similar portions of both autonomic and somatic nervous systems.²

Following obstructions of the urethra, either from stricture or calculus, the urethra gradually distends, then may balloon out at a point of decreased anatomic support, usually on the ventral wall where the urethra is at its weakest. Once started, the distension probably increases fairly rapidly, aided by infection which is usually the case with faulty drainage of urine. Infection and trauma may destroy some of the layers of the urethra, thus changing a "true" to a "false" diverticulum. As the process extends, there results an elevation of the skin overlaying the diverticulum, of normal temperature and color unless there is peri-diverticulitis. Pressure on this pouch will cause the escape of urine from the urethral meatus when the diverticulum is in the anterior urethra, with resultant flattening of the pouch. End results of such infection, which may have associated obstruction, are cystitis, ureteritis and pyelonephritis, frequently with dilatation of the entire tract above the point of obstruction. Thus a local process may become one which ultimately endangers life itself.

SYMPTOMS

The complaints of the patient are dependent upon the abnormal anatomy and physiology present. Difficulty in urinating, dribbling for minutes after the major part of the urine has been voided, the presence of purulent or bloody urine, and a noticeable mass on the underside of the urethra which empties on pressure, may all be present.

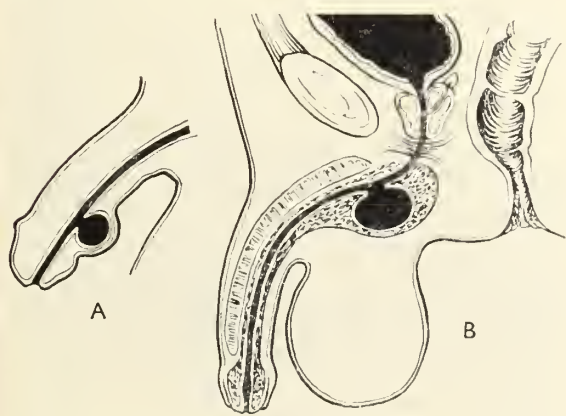


Fig. 1.—Possible locations of diverticula of the urethra. (B) shows location of diverticulum of case report.

from which the diverticulum takes origin, based on anatomical reasons.

Diverticula are more common in the female, possibly because of the trauma during delivery. Apparently the congenital type is less common than the acquired; Kretschmer³ in 1936 found only 21 cases. In the acquired type the anterior urethra is less commonly involved than the posterior, probably due to the complexity of the latter. Fagerstrom² in 1943 reported only 19 cases of diverticula of the anterior urethra previously described from 1900 to 1942, and added two cases of his own to the literature.

Because of the relative rarity of acquired diverticula of the anterior urethra it was believed worthy of note to report an additional case.

ETIOLOGY AND CLASSIFICATION

Since a discussion of the etiology of urethral diverticula involves classification these have been grouped together. The classification of Watts⁵ gives the usual causes:

1. Congenital (Arises from ventral wall, usually anterior urethra).
2. Acquired (Usually from posterior urethra and in adults).

* Read before the Section on Urology at the Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

General symptoms of malaise, chills and fever are possibilities.

DIAGNOSIS

The diagnosis of diverticulum of the anterior urethra is usually easy to make and is based upon the easy palpation of that portion of the urethra. The presence of a mass on the ventral side of the urethra which empties on pressure with escape of fluid from the meatus is diagnostic. Other measures for more accurate localization and information as to complications would include urinalysis and Gram stain, plain x-ray or intravenous urography, blood chemistry study and phenosulphonphthalein for tests of renal function, followed by urethrography and cystoscopy with retrograde pyelography. By these means the complete diagnosis and treatment can be decided.

TREATMENT

Small diverticula which do not contain more than a few cubic centimeters of uninfected urine and cause few if any symptoms do not require treatment if complicating factors are excluded. Larger diverticula and those with resistant urinary infections do require treatment. Suggested methods of treatment vary from dilatation of the diverticular orifice, which probably cures few, to excision of the diverticulum, which is the method of choice. Incision through scrotal or perineal skin is preferred, since there is less likelihood of urethral fistula formation. When the diverticulum is distal to the scrotum, diversion of urine by cystostomy should be done and indwelling urethral catheter avoided.

Preoperative and postoperative use of urinary antiseptics such as the sulfonamides should aid in decreasing infection and thus promote healing.

CASE REPORT

A white male soldier, aged 31 years, was admitted to the 159th General Hospital in England, on December 24, 1944, with a complaint of painful urination of 22 days' duration. The past history was important and disclosed that in October, 1943, 14 months earlier, the patient had fallen on a rock, striking the perineum. This was followed by hematuria for four days. Two months later he noted gradual decrease of force of the urinary stream, which had continued to the time of his entry into the hospital. Four months after the injury there was dribbling of urine after voiding, increasing in amount, and in the past few months he had noticed a perineal swelling. Pressure over this area caused the expulsion of about "one teaspoon of urine" from the meatus. The swelling occurred after urination. Twenty-one days before he entered the hospital the patient had fallen and had struck the right testis and perineum with a rifle butt. Bloody urine was voided three times after the injury, and urination had been more difficult and painful.

Results of physical examination were normal except for the genitalia. A cystic swelling of the mid-perineum, 1-2 cm. in diameter, was present after voiding. Pressure over this area caused urine to flow from the urethral meatus. Rectal examination disclosed normal sphincter tone and prostate of normal size and consistency.

Urinalysis: 3-5 pus cells, 5-15 red blood cells per high power field.

X-ray study: Urethrogram (Fig. 2) showed stricture 1 cm. in length in the proximal third of the anterior urethra. There was a diverticulum 1 cm. in diameter arising from the floor of the urethra at the proximal end of the stricture.



Fig. 2.—Preoperative urethrogram, left oblique, showing stricture of bulbous urethra and diverticulum proximal to it.

Cystoscopy: A No. 24 Brown-Buerger cystoscope met obstruction just proximal to the bulb. A No. 24 McCarthy pan-endoscope was passed to the bulb and visualized a stricture about 5 mm. in diameter at the bulbous area. The urethra distal to this was normal. On removal of the cystoscope a cystic mass 2-3 cm. in diameter was felt in the perineum, pressure on which caused a flow of fluid from the meatus.

Under direct vision with the pan-endoscope a filiform was passed through the stricture and the pan-endoscope removed. A No. 11 F. filiform follower was passed through an area of moderate resistance at the bulbous urethra. A No. 18 F. follower failed to pass with moderate pressure.

On January 11, 1945, and January 18, 1945, the stricture was dilated to 26 F. in calibre. Cystoscopy then revealed a shelf of scar tissue at the bulbous urethra, just proximal to which was a diverticulum 2-3 cm. in diameter on the floor of the bulbous urethra.

Diagnosis: 1. Diverticulum, ventral urethral bulb, 2-3 cm. diameter, associated with and secondary to

2. Stricture, urethral bulb, traumatic, moderately severe, incurred by perineal injury, October, 1943.

Treatment on February 6, 1945, consisted of urethral diverticulectomy. Procedure: Spinal anesthesia. The urethral stricture was dilated to 28 F. A mid-perineal incision 3 cm. in length was carried through the bulbocavernosus muscle to expose the thickened wall of the diverticulum, 2-3 cm. in diameter. The sac was dissected to the junction of the narrow neck with the bulbous urethra. The sac was excised, leaving an opening 3 mm. in length. The urethra was closed in two layers with 00 chromic catgut over a sound, avoiding the mucosa.

The bulbo-cavernosus muscle and Colles fascia were approximated with 00 chromic catgut. A split Penrose drain was placed to the bulb. Superficial tissue and skin were closed with No. 3 silk. A No. 20 F. Foley catheter was inserted as an indwelling urethral catheter.

The postoperative course was uneventful. The patient was given 4 gm. of sulfadiazine daily, and continuous catheter drainage was used. On February 14, 1945, the catheter was removed. The perineum healed rapidly and the patient was able to void freely without the dribbling which had bothered him previously.

Urethrogram (Fig. 3) on March 10, 1945: Complete



Fig. 3.—Postoperative urethrogram, right oblique, showing stricture dilated and absence of diverticulum.

absence of diverticulum previously described. Partial stricture present in proximal third of anterior urethra, deformity not as severe as on previous examination of January 8, 1945.

PATHOLOGIST'S REPORT

Pathological report by Captain Aaron Plachta, M.C.: Grossly the specimen consists of two portions of tissue measuring 1.3 x 1.0 x 0.3 cm. One surface is covered by an opaque pale gray smooth membrane. The other surface is irregular and dark brown. The cut section reveals a spongy, dark brown surface. Microscopic: The section

consists of delicate, loosely arranged connective tissue fibers containing dilated capillaries. Scattered are occasional round cells. The epithelial covering shows blunt pegs, the cellularity of which is uniform. Diagnosis: Diverticulum of urethra.

DISCUSSION

The case reported meets all the requirements as to the symptoms and physical findings in the usual case of urethral diverticulum. A combination of stricture plus local trauma to the proximal urethra is the ideal one for the production of a diverticulum, and such existed here. The history of repeated perineal trauma suggested the presence of a diverticulum and it was found.

It is not believed necessary to invoke the added factor of neurogenic dysfunction in this case, although Fagerstrom has presented two patients in whom diverticula of the anterior urethra developed following suprapubic prostatectomy and in whom he believes neurogenic dysfunction was the cause.

Treatment of this case followed the accepted method of excision of the diverticulum, in this case through the perineum, with drainage of urine through a urethral catheter. Healing was per primam. Future treatment is to consist of urethral dilatations to keep the stricture under control and prevent a possible recurrence of the diverticulum.

CONCLUSION

Urinary symptoms of dribbling after voiding, obstructive symptoms, and especially the presence of an urethral diverticulum of the anterior urethra surface should immediately suggest the presence of a collapsible swelling on the ventral urethral. The condition is rare and usually is due to a combination of urethral obstruction plus local trauma, as was demonstrated in this case.

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Indications For the Use of Electroshock Treatment of Out-Patients*

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SINCE the advent of convulsive shock therapy in the treatment of the mentally ill, many favorable results have been reported in the literature.¹

In this therapy, insulin, which was the first to be employed, depended on the production of a moderate to deep coma induced by large doses of the drug. This technique was heralded at first as a specific or near specific for most cases of schizophrenia. Though first remission rates reported were high, later follow-up studies revealed that many cases relapsed and, at present, most reports for this therapy are conservative. Others are controversial. Because of these factors and, in addition, the necessity for a larger personnel and a far greater time needed in its administration, the technique has been abandoned by many practitioners, clinics, and state hospitals. Shortly after the introduction of insulin therapy, a European physician, Meduna, experimented with metrazol to produce isolated convulsions in the treatment of schizophrenia.

Meduna's discovery that metrazol alone produced satisfactory results gave impetus to the adoption of metrazol in preference to insulin. In turn, however, certain disadvantages experienced with metrazol therapy brought about the current preference for single convulsive seizures produced with the use of electricity. In fact, the superiority of electricity over metrazol in the production of the isolated convulsion is now without question.

The most important advantages of electroconvulsive therapy, as compared with metrazol, are as follows:

1. Consciousness is lost instantaneously, thereby eliminating the fear and intense anxiety the patient experienced for approximately fifteen seconds before the metrazol took effect.

2. Whereas in metrazol treatment the injection of large amounts of a toxic substance into the bloodstream occasionally led to serious complications, the use of electricity produces no such undesirable effect.

3. More treatments can be given in a shorter period of time with fewer personnel.

4. Because electroshock was more acceptable to the patient for the reasons named above, it was soon observed that patients were more willing to submit to the treatment.

These advantages, plus recent modifications in the technique, have made this method the treat-

ment of choice in the majority of the psychoses and in a few selected cases of the psychoneuroses.

It was logical that these advantages of the method would suggest its application in the treatment of the ambulatory patient. The possibility of treating ambulatory patients by the extra-mural method was first recognized by Bini.² However, little systematic use of ambulatory treatment has been reported. Nevertheless, the writer feels that the procedure is becoming increasingly more popular. It is probable that more and more patients will eventually be treated by this method.

The writer first employed this extra-mural plan in the treatment of an ambulatory patient in 1940. The case was one of a mild depression. The patient came to the sanitarium on treatment days only, remained half a day following the treatment, and then returned home. After five convulsive treatments, he recovered. The method used in this case was that of curare-metrazol. At the present time, it is the author's opinion that ambulatory treatment is indicated and preferable in a large number of selected cases.

In the writer's experience to date, the treatment of ambulatory patients has been carried out in special rooms offered for this purpose by small sanitariums and employing the use of the sanitarium personnel. This compares with the average setup in a clinic or ward in a hospital. There is no reason why these conditions cannot be duplicated in a properly equipped office. Office ambulatory treatment, although criticized at first, is now acknowledged by many physicians as satisfactory. However, it must be borne in mind that the extra-mural method, whether treatment is given in hospital, sanitarium, or office, still depends on the psychiatrist's experience and wisdom in selecting the proper cases.

The specific indications for the use of convulsive therapy in ambulatory patients fall into the following categories:^{3,5}

1. Cases who require "maintenance treatment," especially those with the diagnosis of chronic schizophrenia. In this group are many who have received treatment in private or public institutions but who have suffered a relapse after being discharged. It has been found by many observers that if these patients are followed up by giving more treatment on an ambulatory status they do surprisingly well and further hospitalization is often found to be unnecessary.

2. Moderate to severe cases of psychoneuroses with a strong affective component and cases of reactive depression. Convulsive therapy by the ambulatory method, where indicated, may be the

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only treatment procedure which can be carried out in the majority of these cases, since these patients are seldom willing to be confined in institutions where the treatment is given.

3. Certain selected cases of schizophrenia, especially those which are borderline and show, in addition to the schizophrenic symptomatology, many symptoms of a psychoneurotic character, including hysteria.

4. Mild to moderate depressive reactions, such as are seen in certain types of psychoneurotic depressions, manic-depressive depressions, and involutional types. In the writer's experience, presenile and depressions in the older age groups are not recommended for ambulatory treatment due to frequency of undesirable organic psychotic reactions in this group, which may occur and complicate the recovery process. Acutely severe depressive reactions in this group do not indicate this procedure. Frequently, such patients show an uncooperative attitude which often makes treatment impossible. Also, the risk of suicide is too great.

RISK OF SUICIDE

To amplify in regard to specific indications and certain well-known contraindications, the following points deserve attention.

So far, the majority of patients to whom the writer has applied the ambulatory method have been the depressive reaction group. These include both the psychoneurotic and psychotic depressions. This type of patient has been in the majority because, as previously noted, these individuals are reluctant to enter a mental hospital for treatment and, if ambulatory therapy were not possible, many of these individuals would refuse treatment altogether. While the risk of suicide in these individuals must be borne in mind and has been mentioned as a contraindication, nevertheless, it is the writer's opinion that ambulatory treatment is still indicated in this group.

Certain selected cases of schizophrenia have been treated with some success.^{4,6} These cases presented some symptoms of a psychoneurotic nature and, therefore, may be regarded as borderline cases. Most cases of schizophrenia are not applicable to extra-mural treatment because of the long course of treatment required, such as is necessary in the paranoid groups. The initial improvement in these cases often leads to a premature discontinuation of treatment. Also, the organic side-reactions often seen present an additional contraindication. Therefore, extra-mural therapy is not recommended in these cases.

Chronic schizophrenics needing treatment at

weekly or longer intervals in order to keep them out of institutions are almost always suited for extra-mural therapy. As a matter of fact, clinics have already been established for this type of patient. Furthermore, it should be stated that maintenance therapy is ideally suited to the extra-mural procedure. For patients who relapse after treatment in a hospital, and yet for whom further treatment is indicated, a return to an institution would represent a regression. Ambulatory treatment makes it possible to avoid this almost tragic outcome. Therefore, many patients who might otherwise be permanently hospitalized may be rehabilitated by this method.

CONCLUSIONS

1. The cases treated by the writer fall into the following groups: depressive reaction types; psychoneurotic types; mild schizophrenic types and chronic schizophrenics.

2. Of the foregoing types, there are fewer indications for the treatment in the psychoneurotic group. However, in selected cases, the method may prove to be a valuable adjunct to psychotherapy.

3. Probably the best application of the ambulatory method is in the maintenance treatment of chronic mental disease, especially that of schizophrenia. In the future, it may be found through the use of extra-mural maintenance therapy that many individuals may be restored to a normal or near normal mode of living who otherwise would be confined to an institution for life.

4. In the writer's experience, depressions, whether reactive, psychoneurotic, or psychotic, have been successfully treated in spite of the fact that the suicide tendencies may have been present.

5. The importance of a careful selection of cases cannot be overemphasized.

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A Case of Coccidiosis in Man

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COCCIDIOSIS, a protozoan disease is caused by Coccidia. Infection of man is comparatively rare and little can be found in the literature upon the subject. Although the schizogonic phase of the life cycle in man is unknown, it is assumed that it is similar to that in animals. Its pathogenicity in man is not too well established and is frequently debated.

Coccidiosis in animals is of common occurrence. It may cause a harmless or mild parasitization or an enzootic, severe and fatal enteritis, depending upon the species of coccidia and animal involved. The protozoa are found within the epithelial cells of the intestine and organs connected with it and they have a very high degree of host specificity.

Briefly, the life cycle in the epithelial cell in animals can be compared to malaria in the red blood cell, in that it grows at the expense of the cell; it multiplies asexually (schizogony), forming merozoites. They later re-infect other cells or proceed to the sexual cycle of forming micro- and macrogametocytes. After fertilization of the macrogamete, the zygote develops a resistant wall about itself (oocyst) and is expelled in the feces (Figure 1A). Under a suitable environ-

ment had a history of being afflicted with diarrhea while in the Italian battle zone 30 days before. During hospitalization at various forward hospitals, a laboratory reported the presence of *Endamoeba histolytica*, *Endolimax nana* and *I. hominis*. The patient was treated from November 7 to November 27 for amoebiasis with emetine hydrochloride intramuscularly and carbarsone orally. The coccidial oocysts were confirmed November 26 by the author but no trophozoites or cysts of the other two protozoa could be found. At this time, a daily quantitative oocyst count upon freshly passed stools was suggested, the first of which was made on November 27. The number of oocysts per gram of feces was determined by the method described by Beach.¹ The patient was reportedly not diarrheal and had no fever but the W.B.C. rose to 20,000 which prompted sulfonamide therapy on the 29th of November.

The result of the daily oocyst count, per gram of feces, was 61,500 on November 27 which progressively decreased to 34,000 on November 28, 7,300 on November 29, 1,600 on November 30, and none on December 1, 2, and 3. Circumstances would not permit further observations.

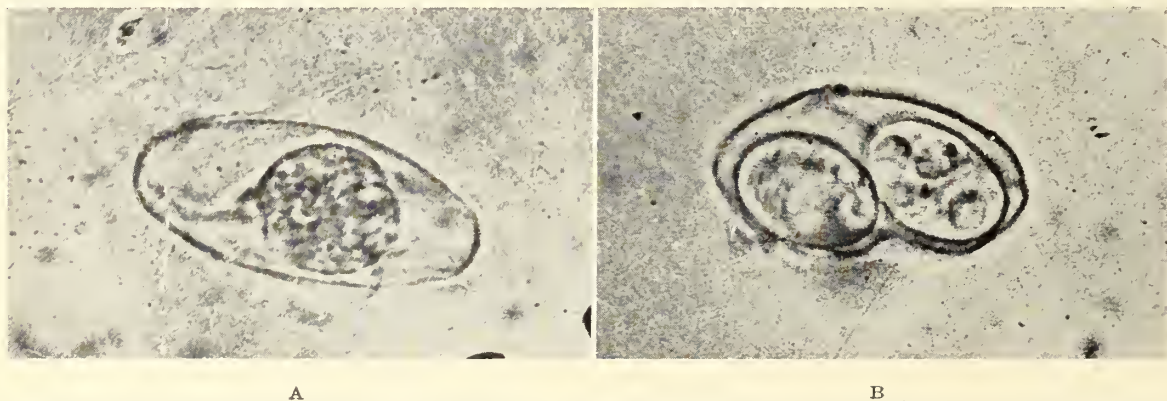


Fig. 1.—A, an unsporulated oocyst as it appears in freshly passed stools. B.—A sporulated oocyst. Photographs taken 14 months later from the feces sample reported, preserved in 2.5 per cent potassium dichromate. (Enlarged approx. 3,000 times.)

ment of moisture, temperature and oxygen (usually 24 hours or longer depending upon the species and conditions) it undergoes sporulation and is then in its infective stage (Figure 1B).

In one case in which a human was infected, a stool sample was submitted to the laboratory† for confirmation of an "egg" which proved to be coccidial oocysts of *Isospora hominis*. The pa-

From this history and data it is interesting to note that although the protozoa, *E. histolytica* and *E. nana* were not observed in the feces between the 21st and 27th day following the first day of therapy, the oocysts of *I. hominis* were found in considerable numbers during a part of this period. Emetine hydrochloride and carbarsone apparently were not efficacious agents for eradicating this sporozoan.

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MEDICAL PROGRESS:**Rheumatoid Spondylitis: Its General Features and Management***EDWARD W. BOLAND, M.D., *Los Angeles*

RHEUMATOID (ankylosing) spondylitis is one of the important causes of chronic back disability in young adult males. When detected and treated during its early stages, much can be accomplished toward ameliorating the symptoms and in preventing deformity; and at times the disease may be arrested. Unfortunately rheumatoid spondylitis often remains unrecognized until after marked spinal rigidity ("poker spine") and pronounced calcification of the paraspinal ligaments ("bamboo spine") have occurred; at such a late stage little can be expected from preventive or corrective therapeutic procedures. With the hope of encouraging early recognition and early treatment of this potentially crippling disease a brief discussion of its general features and management is presented herein.

Rheumatoid spondylitis is a chronic and usually progressive disease of the synovial joints of the spine and of the adjacent soft tissues. The pathologic changes in the joints consist of synovitis, chondritis and juxtaarticular osteitis, and are similar to those found in peripheral rheumatoid arthritis.^{8,9} The process almost invariably begins in the sacro-iliac joints and, when the disease is progressive, it spreads upward to involve the apophyseal (small posterior intervertebral or facet joints) articulations of the lumbar, thoracic and cervical regions, and the costovertebral joints. Inflammatory changes probably also occur in the paraspinal ligaments, the apophyseal joint capsules and the erector spinae muscles.³ Later in the course of the disease, calcific and osseous changes develop in the paraspinal ligaments. The intervertebral discs are not affected, nor are the vertebral bodies except for secondary demineralization.

The disease is known by many other terms, such as, rhizomelique spondylitis, Marie-Strumpell's disease, spondylitis ossificans ligamentosa, von Bechterew's syndrome, ankylosing spondylarthritis, atrophic spondylitis and spondylitis ankylopoietica. The confusion in terminology has been prompted by differences in opinion regarding the fundamental nature of the disease, and by classifications based on locations of the predominant findings in the spine.

There are several facts to substantiate the belief that this disease is merely rheumatoid arthritis as it involves the spine: (1) typical peripheral rheumatoid arthritis coexists in approximately one-fourth of cases; (2) the peripheral joints so involved show histopathologic changes

identical to those found in rheumatoid arthritis (without accompanying spondylitis);²¹ (3) pathologic specimens taken from apophyseal joints during active phases of the disease reveal microscopic findings similar to those seen in peripheral rheumatoid arthritis;^{8,9} (4) the elevated erythrocyte sedimentation rate and the clinical pattern resemble rheumatoid arthritis. Some investigators, especially those in Europe, do not accept this identity but believe that ankylosing spondylitis is a separate disease entity because (1) ligamentous calcification and ossification, so characteristic of advanced spondylitis, are not features of rheumatoid arthritis as it involves peripheral joints, and (2) the sex incidence favors males (20:1¹) while peripheral rheumatoid arthritis favors females (3:1).

INCIDENCE

The frequency with which rheumatoid spondylitis affected soldiers of World War II was surprisingly high. In one army general hospital, 7.5 per cent of all patients admitted to the medical service had this disease. Moreover, 18 per cent of soldiers admitted to that hospital for chronic back complaints had spondylitis.⁴

At the Army Rheumatism Center, Army and Navy General Hospital, 1,084 cases of rheumatoid spondylitis were admitted during a period of two years.⁵ These comprised 18.1 per cent of 6,000 consecutive admissions for all types of rheumatic diseases. In other words, approximately one out of every five soldiers admitted had rheumatoid spondylitis. Moreover, almost as many soldiers were admitted with spondylitis (with and without accompanying peripheral arthritis (1,084) as were admitted with peripheral rheumatoid arthritis alone (1,127).

These figures are in sharp contrast to those which have been based on civilian practice. Hare,¹⁴ for example, found only 26 instances of spondylitis among 1,179 patients with arthritis, an incidence of 1.7 per cent. And the ratio of peripheral rheumatoid arthritis to spondylitis among civilians has been reported as 11.1,⁸ 13:1³⁰ and 19:1.¹⁴ The influence of strenuous physical activity and adverse living conditions incident to military service in bringing to light mild and early cases, and the predilection of the disease for males of military age, probably explain why spondylitis was encountered so frequently in soldiers.

CLINICAL PICTURE

Onset: Because the early symptoms of rheumatoid spondylitis are frequently mislabeled as

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muscular rheumatism, fibrositis, lumbago, chronic low back strain, idiopathic sciatica or even kidney disease, and because the real diagnosis is often overlooked for years, the clinical features which characterize the onset are of considerable importance.⁴ In approximately 80 per cent of cases the onset is insidious. The first complaints are usually located in the lower part of the back and most often consist of aching and stiffness. Sharp pains or "catches" in the buttocks, hips or lower back may also be complained of.

Usually at first aching and stiffness are mild and recur periodically, lasting only a few days at a time. These symptoms usually present typical qualitative characteristics of "fibrositis" in that they are most pronounced in the morning on arising, are accentuated by physical inactivity and damp weather, and are ameliorated by mild exercise, local heat, dry weather and acetylsalicylic acid. Occasionally the first episodes are temporarily disabling and may be described by the patient as "attacks of lumbago." Later, after the disease has progressed, the aching and stiffness tend to become persistent and to lose their typical "fibrositis" characteristics.

Less frequently the first symptoms are described as a "dull ache," a "tired feeling" or a "soreness" in the lower back which often are aggravated by prolonged weight bearing or physical activity entailing movement of the spine. Such discomfort may be pronounced at night. In approximately 10 per cent of cases the first symptom is sciatic pain. Occasionally, thoracic girdle pains or radicular pain in the costovertebral angle, abdomen or inguinal region, simulating visceral disease, is the initial symptom. Occasionally, progressive limitation of back motion without actual discomfort is the only complaint.

Symptoms and physical findings: The pattern of rheumatoid spondylitis is fairly characteristic but the clinical picture at the time of examination is variable and depends upon: (1) the severity of the disease, (2) its duration, (3) the extent of spinal involvement, and (4) the activity of the process at individual levels of the spine. The disease may be localized to the sacro-iliac joints or at the other extreme the entire spine may be affected. The disease may be quiescent in one region and active in another. It may be mild, slowly progressive and accompanied by little actual disability. Or conversely, it may be rapidly progressive and disabling from the onset. The intensity of the symptoms and extent of the physical findings depend upon such qualifying factors.

Those clinical features which serve to indicate active involvement of the various regions of the spine may be summarized as follows:

Sacro-iliac involvement: When the disease is localized to the sacro-iliac articulations the symptoms and findings consist of: aching, stiffness and pain in the lower back as already described; intermittent sciatica (10 to 20 per cent of cases); tenderness over the sacro-iliac joints on percussion and palpation (in approximately 50 per cent of cases); pain on sacro-iliac joint motion as

produced by orthopedic maneuvers; and mild lumbar muscle spasm without actual restriction of motion. But in early or mild cases, or when the sacro-iliac joints are ankylosed (and unaccompanied by higher involvement) abnormal physical findings may be entirely lacking.

Lumbar involvement: Because the disease almost always begins in the sacro-iliac joints and then later spreads to higher levels, the lumbar spine is rarely involved alone; but the dominant physical findings are often located in this region. Those features which accompany lumbar involvement are: pain, aching and stiffness in the lower back; lumbar paravertebral muscle spasm (often pronounced); limitation of lumbar motion; straightening of the normal lumbar lordosis; tenderness on percussion over the lumbar spine; pain on forced motion of the lumbar spine; and later, muscle atrophy in the lower lumbar region. (Figure 1.)



Figure 1.—Rheumatoid spondylitis with involvement of both sacro-iliac joints, the lumbar and thoracic spine. Note the straightening of the lumbar spine, the obvious restriction of motion and the lumbar muscle therapy. The lower back has an "ironed out" appearance.

Thoracic involvement: Essentially the same localizing signs as outlined for the lumbar segment are present in the thoracic region when it is affected. In addition the following special features usually develop: thoracic girdle pain; chest pain on deep inspiration; diminished chest expansion; flattening of the anterior chest (expiratory position); and thoracic stoop (thoracolumbar kyphosis). (Figure 2.)

Cervical involvement: With involvement of the cervical spine the same general features are



Figure 2.—Typical posture with involvement of all segments of the spine. Note the thoracolumbar stoop, the flattened anterior chest wall and protuberant abdomen. The neck is beginning to protrude. The spondylitis in this case was rapidly progressive, all segments being involved 18 months after onset.

present as in other regions. The neck often assumes a protruded position. Motion in all directions may be markedly impaired and the patient may have to pivot his entire body in order to look sideways.

Associated findings: Iritis or iridocyclitis occurs with approximately the same frequency as it does in peripheral rheumatoid arthritis. General constitutional symptoms such as weight loss, anorexia, fatigue, low grade fever and weakness are not, as a rule, as prominent as in peripheral rheumatoid arthritis. In mild cases such symptoms may be entirely absent and even in cases of moderate severity they are rarely pronounced

unless peripheral arthritis coexists. The constitutional reaction roughly parallels the height of the erythrocyte sedimentation rate.

Arthritis of the peripheral joints coexists in 18 to 25 per cent of cases. In our experience the small joints of the hands and feet are involved just as frequently as the larger joints of the extremities;⁴ this is contrary to the experience of some. In early cases at least, the hips and shoulders are not commonly affected. The clinical and roentgenographic manifestations in the spine appear to be identical regardless of whether peripheral joints are or are not also affected.

Laboratory findings: The erythrocyte sedimentation rate is elevated in approximately 80 per cent of active cases; it serves as the most consistent laboratory gauge of activity in spondylitis. The usual range is between 20 and 60 mm. in one hour (modified Westergren technique, normal for males below 20 mm. in one hour). The rate may be normal in mild but clinically active cases. Marked anemia is rare but moderate hypochromic anemia is present in about 30 per cent of cases.

The cerebrospinal fluid was studied recently in 50 soldiers with spondylitis.⁶ The initial manometric pressures, cell counts and concentrations of sugar were normal and the colloidal gold reaction was abnormal in only one of the 50 patients. But there was an increase in the total protein content of the lumbar fluid in 21 (42 per cent) of the 50 patients. The increased protein content was found to be moderate in amount, ranging between 46 and 105 mg. per cent. The protein content of the cerebrospinal fluid bore no consistent relationship to the duration of the disease or to the degree of spinal extension, but seemed to be related to the severity of the spondylitis: the total proteins were increased twice as often and their average concentrations were almost twice as high in severe rapidly progressive cases as in less severe progressive cases. Similar elevations of the cerebrospinal fluid protein in spondylitis have been reported by others.^{12,19}

ROENTGENOGRAPHIC PICTURE

Abnormal x-ray findings in the joints of the spine result from destruction of articular cartilage and from alterations in juxta-articular bone. When the pathologic process is restricted to the synovial membranes roentgenograms are negative (swelling resulting from synovial effusion into the spinal joints cannot be visualized roentgenographically). As in peripheral rheumatoid arthritis, it may take months or years to develop sufficient cartilaginous or osseous alteration to be recorded on roentgenograms; the pathologic changes in some joints may never progress sufficiently to show positive x-ray findings. Therefore there is almost always a time lag between the development of localizing physical signs and the appearance of roentgenographic abnormalities. For example, x-ray changes in the sacroiliac joints may not appear for months or even years after the onset of back symptoms.³

Changes in the sacro-iliac joints: The most reliable and the earliest x-ray changes in rheumatoid spondylitis are found in the sacro-iliac joints. The findings are usually bilateral but may be more pronounced on one side or the other. The joints at first appear blurred and their margins are indistinct; the joint space may give the false impression of being widened or it may appear narrowed. The first definitive abnormalities consist of sclerosis and/or spotty demineralization of subchondral bone. These are usually located in the juxta-articular portion of the ilium, especially at the caudal one-third of the joint; later similar changes develop in the sacrum. As the process progresses, demineralization and sclerosis gradually cover a wider subcortical zone. Later, varying degrees of joint dissolution occur; the margins may appear serrated or the joint may look irregularly mottled. Finally, the joint space becomes traversed by bony trabeculae and fusion between the sacrum and ilium takes place. With the development of complete ankylosis subchondral sclerosis gradually fades but if spotty rarefaction has been pronounced, residues of such defects may be evident for years.

The severity of spondylitis is often reflected by the character of the sacro-iliac changes.³ When the disease is mild, subchondral sclerosis together with narrowing and blurring of the joint are the dominant features; rarefaction and joint mottling are minimal or absent. (Figures 3 and 4.) In cases of moderate severity subchondral



Figure 3.—Normal sacro-iliac joints. Note the clear joint spaces and the well-defined articular margins.

rarefaction and sclerosis are usually present in fairly equal proportions and mottling of the joint is definite. (Figure 5.) When the disease is



Figure 4.—Mild and fairly early rheumatoid spondylitis involving the sacro-iliac joints. The joints are hazy with poorly defined margins and appear narrowed. Subchondral sclerosis is prominent while spotty rarefaction is minimal.



Figure 5.—Sacro-iliac joint changes in rheumatoid spondylitis of moderate severity. The joint spaces are mottled. Subchondral rarefaction and sclerosis are present in fairly equal proportions.

severe, subchondral rarefaction and joint destruction are extreme, but sclerosis is rarely conspicuous. (Figure 6.)

Changes above the sacro-iliac joints: Abnormal x-ray findings in the lumbar, thoracic and cervical regions are not found as consistently nor are they as reliable from the diagnostic stand-

point as the changes which occur in the sacro-iliac joints. The most common finding above the sacro-iliac joints consists of calcification of the paraspinal ligaments. This is a relatively late



Figure 6.—Severe rapidly progressive rheumatoid spondylitis. Note the marked destruction of the sacro-iliac joints.

manifestation, however, and the lumbar spine may be involved clinically for several years before ligamentous calcification appears. Calcification is usually first noted at the lower thoracic and lumbar levels, especially in the anterior longitudinal ligament. With extensive calcification and ossification of the ligaments the well-known picture of a "bamboo spine" is produced. (Figure 7.)

Definite x-ray changes in the apophyseal joints usually develop even later than ligamentous calcification (except in severe rapidly progressive cases).³ Further, alterations in these joints are inconstant; even after the disease has been present in the lumbar spine for several years only one or a few scattered apophyseal joints may appear abnormal. Moreover, examination of these joints is difficult because of the wide variations which exist in their planes; often several views with different degrees of obliquity are needed for accurate interpretation. But such detailed study seldom gives any information which is not already obvious from physical examination and x-ray study of the sacro-iliac joints. When findings in the apophyseal joints are present they consist of subchondral rarefaction and/or sclerosis of the facets, irregularity of the articular margins, narrowing of the joint spaces and eventually ankylosis.

Late in the disease the vertebral bodies may be osteoporotic but otherwise they are not affected. The intervertebral discs remain normal. Straightening of the normal lordotic curve is common when the lumbar segment is involved. Calcification of the costovertebral joint capsules is an infrequent late finding. The symphysis pubis occasionally may be affected; it may appear widened with ragged margins; later ankylosis may develop.

DIAGNOSIS

The diagnosis of rheumatoid spondylitis is not difficult when the disease has advanced sufficiently to produce its characteristic physical changes (such as limitation of spinal motion, persistent muscle spasm, straightening of the lumbar spine, restricted chest expansion, etc.) and its characteristic x-ray alterations in the sacro-iliac joints, paraspinal ligaments and apophyseal articulations. But early in the disease when physical and roentgenographic findings are minimal or absent, and in mild cases when constitutional symptoms may be lacking and the erythrocyte sedimentation rate may be normal, diagnosis is more difficult.⁶

Early symptoms such as persistent or chronic recurrent low back aching and stiffness occurring in a young man should make one suspect rheumatoid spondylitis, especially if the erythrocyte sedimentation rate is elevated. The disease should also be suspected when vague pains or soreness in the lower back are persistent, especially if

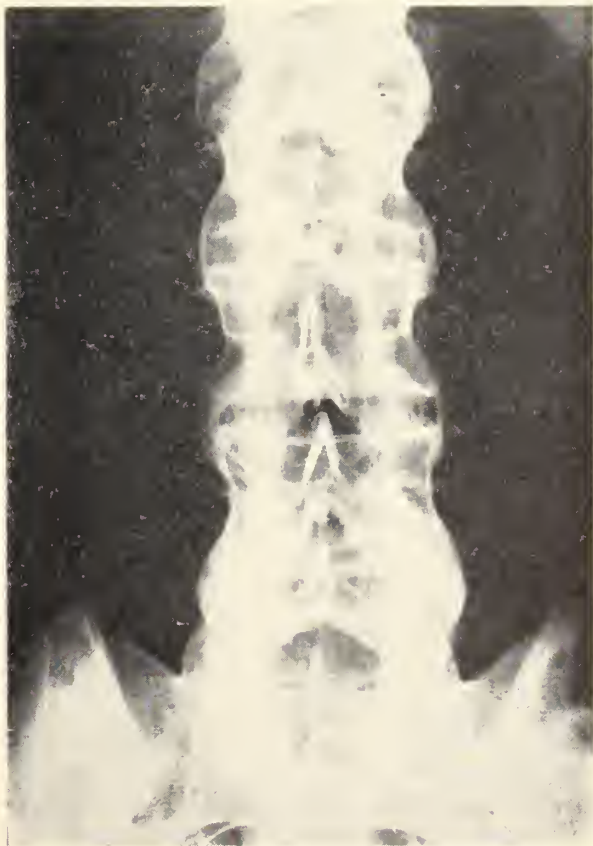


Figure 7.—Terminal picture of rheumatoid spondylitis illustrating a typical "bamboo" spine and complete ankylosis of the sacro-iliac joints.

accompanied by tenderness over the sacro-iliac joints, and an elevated erythrocyte sedimentation rate. Persistent back symptoms developing in a patient with peripheral rheumatoid arthritis are usually indicative of a spread of the disease to the spine. But an unequivocal diagnosis of spondylitis cannot be made until characteristic roentgenographic changes are demonstrable in the sacro-iliac or apophyseal joints; such changes may not appear for two or three years after the onset of symptoms.

It should be kept in mind that radicular pains, especially sciatic and thoracic, are common symptoms of rheumatoid spondylitis. Sciatic pain usually is not severe, is often intermittent, and may alternate from side to side; abnormal neurologic findings, such as diminished or absent Achilles reflexes or sensory changes, are not found as a rule. In making differential diagnosis between spondylitis and other causes of low back disability accompanied by sciatica (such as spinal cord tumor, ruptured intervertebral disc, etc.) it is important to remember that the cerebrospinal fluid protein is often (also) elevated in spondylitis. But the protein content in spondylitis is rarely increased above 100 mg. per cent; thus in patients with chronic low back disability with sciatica, if the protein is elevated notably above 100 mg. per cent, some cause for the increase other than spondylitis should be sought even though spondylitis is (also) present.⁶

CLINICAL COURSE

The clinical course is subject to wide variations. Exacerbations and partial or complete remissions are common. Apparently the disease may terminate spontaneously at any point and in some instances it may never extend beyond the sacro-iliac joints. The tendency, however, is toward relentless progression with ultimate involvement of the lumbar, thoracic and cervical regions.

The disease most often is mild or moderate in severity; severe rapidly progressive cases are rarely encountered. When mild, the disease tends to run a relatively benign course; the early symptoms may have only nuisance value to the patient, and even after the spine is extensively involved, disability may not be great. When mild cases are progressive it may take 15 to 25 years for a poker back deformity to develop.³

When the disease is of moderate severity the disability is usually great enough for the patient to consult a physician. The sedimentation rate is almost always elevated and constitutional symptoms, although not pronounced, are present. Progression is more rapid and poker back deformity may develop within five to ten years.

Severe cases are usually incapacitated from the onset. Constitutional reaction is marked and progression may be so rapid that the whole spine is rigid within one to three years.

TREATMENT

Although there is no known cure for rheumatoid spondylitis, much can be accomplished toward ameliorating the symptoms and preventing and

correcting spinal deformity if treatment is instituted early. Apparently, as a result of therapeutic effort, the disease may at times even be arrested.¹¹ Only an outline of the more important medical, physiotherapeutic and orthopedic measures used in the treatment of early or relatively early cases will be presented herein; orthopedic corrective procedures designed for patients with long standing advanced disease will not be discussed.

Education of the patient: As with all victims of chronic disease, cooperation is best obtained by familiarizing the patient with the facts relating to his disability. The spondylitic patient should be fully instructed regarding the nature of his disease, its potentially crippling end result (especially if treatment is neglected), and what can be expected from treatment. If so indoctrinated, he will be more apt to persist in carrying out the various exercises and other home measures which form such an essential part of his regime. At the Army's Rheumatism Centers such instructions were successfully given by group lectures.¹⁶

General measures: Measures designed to improve general health are just as important in the treatment of spondylitis as they are in peripheral rheumatoid arthritis. Such measures should include a high caloric diet with vitamin supplements, iron salts if hypochromic anemia is present, and adequately regulated rest. Physical activity requiring undue use of the back should be curtailed routinely. Patients with disease of mild or moderate severity should have at least nine hours of bed rest at night and an additional one or two hours in bed during the day. Complete bed rest is rarely indicated; occasionally it is advised for patients with severe rapidly progressive disease. Acetylsalicylic acid should be given at frequent intervals, if necessary, to control pain. Baking, massage, diathermy and other locally applied physiotherapeutic measures may at times be of help in giving symptomatic relief; occasionally they tend to aggravate the symptoms.

Prevention and correction of postural deformities: Much can be accomplished in preventing postural deformities with relatively simple exercises if these are carried out conscientiously day after day for a period of years. Patients should be made to understand that the supervised exercises performed at the hospital or physician's office are merely instruction periods; when instruction is completed the rest is up to the patient himself. When the disease is early or relatively early, great emphasis should be placed on making the patient posture conscious. He must be taught to assume a proper stance at all times, with the lower abdominal muscles pulled in, the thorax raised, the shoulders squared and the head back. In addition he must be taught trunk stretching exercises (in both the erect and supine positions), hamstring and calf stretching exercises, deep breathing exercises and exercises for the correction of special postural defects; these should be performed twice daily at home. Simple analgesics, such as acetylsalicylic acid, given 30

to 45 minutes beforehand, and/or a hot tub bath often allow such exercises to be accomplished more readily. The spondylitic patient should be instructed also in the use of a firm bed (with boards), without pillow and in the use of a blanket roll for spinal hyperextension. Such measures should be carried out as preventive therapy even though postural deviations are minimal or have not yet occurred.

In a surprisingly large percentage of patients with relatively early postural deformities correction can be accomplished by postural exercises alone. Spinal braces should be reserved for patients with more advanced disease whose postures cannot be adequately corrected or maintained by exercises alone and for those whose pain and muscle spasm cannot be relieved by other means. Plaster or leather jackets, as advocated by some,²⁹ are seldom necessary in the earlier stages. Hyperextension frames, hyperextension beds, and plaster half shells are needed only when spinal deformity cannot be corrected with other methods; occasionally plaster half shells may aid in controlling muscle spasm and pain in severe cases.

Roentgen therapy: Although the results of roentgen therapy applied locally to joints for relief of pain and local manifestations in peripheral rheumatoid arthritis have been unpredictable and unreliable, consistently favorable reports regarding the results of x-ray therapy for rheumatoid spondylitis have appeared in the literature since 1930.^{13, 17, 18, 23, 24, 25, 26, 31}

In 1941, Smyth, Freyberg and Lampe²⁸ reported their results in 52 patients with rheumatoid spondylitis treated with roentgen therapy. Seventy-two per cent of these 52 patients obtained significant subjective relief and 50 per cent had definite improvement in objective clinical findings. In 41 per cent of those with elevated erythrocyte sedimentation rates, significant reductions in the rates resulted. In some instances all clinical evidences of the disease disappeared and the erythrocyte sedimentation rate returned to or toward normal, suggesting that at times the disease may possibly become arrested as a result of x-ray therapy. Similar results have been reported by Hare¹⁴ and others.^{2, 15, 20, 22}

The technique of therapy used by Smyth, Freyberg and Lampe, and now the one most commonly used in this country, is as follows: 200 kilovolts, with 0.5 mm. of copper and 1 mm. of aluminum filtration, a half value layer of 0.9 mm. of copper, and a 50 cm. skin target distance with an output of 50 "r" (measured in air) per field (usual size of field, 200-300 square cm.). Each portion of the spine involved clinically or roentgenographically received three series of 600 "r" each. Recently Freyberg¹¹ has advocated additional x-ray treatment when recrudescences of symptoms occur, treatment being directed to the sites of recurrent symptoms.

Recently a controlled study of the effect of roentgen therapy in rheumatoid spondylitis was made at an Army Rheumatism Center.²⁷ Seventy-five soldiers with typical rheumatoid spondylitis

(mostly early or relatively early cases) were divided into three groups of 25 each: one group received roentgen therapy only (using a technique similar to that described above), the sacro-iliac joints and all other involved regions of the spine receiving two series of 600 "r"; a second group was given only placebo or psychotherapy, the patients going through the same routine as the roentgen therapy group but receiving no actual irradiation (the x-ray apparatus was not turned on); a third group was treated with breathing and postural exercises only.

The results of this study indicated that roentgen therapy applied locally to the sacro-iliac joints and to the involved regions of the spine was of definite value in rheumatoid spondylitis; 92 per cent of those so treated were improved symptomatically and 68 per cent were improved objectively. The degree of improvement noted at individual levels of the spine often depended upon how long the particular region had been involved and how far the structural changes had advanced; recently involved regions demonstrated better symptomatic response to x-ray treatment than did regions where the disease had been present for years. Although the degree of improvement was pronounced in some, evidence of complete remission was not noted in any case (the patients, however, were observed for a period of only six months). The results obtained from breathing and postural exercises alone were inferior to those obtained from roentgen therapy. That the effect of roentgen therapy was not psychic in origin was evidenced by the fact that objective improvement occurred in only 8 per cent and subjective improvement in 28 per cent of the placebo therapy group.

Whether roentgen therapy actually modifies the activity of the disease process, or only produces analgesia resulting in a lessening of the clinical manifestations, cannot yet be determined. Controlled follow-up studies for at least ten years will be needed to clarify this important point. Nevertheless, roentgen therapy applied to those areas of the spine which are sites of active involvement is, at least, an important adjunct in the treatment of rheumatoid spondylitis. But x-ray therapy should not be relied upon alone; it should be combined with other measures such as those designed to improve general health and to prevent or correct postural deformities. Even if roentgen therapy should prove to have only an analgesic effect, such treatment is worthwhile as it allows better results to be obtained from postural and breathing exercises.

Other measures: Gold salts are said to be of little or no value in the treatment of rheumatoid spondylitis,⁷ but have been used in only a small number of reported cases. It is probable that they deserve further trial especially in the earlier stages of the disease. Favorable results have been reported by Forrestier with subcutaneous injections of radon.¹⁰ Intravenous injections of typhoid vaccine to produce foreign protein reactions have been used for years and may possibly be of

value at times in altering the activity of the disease; whether actual remissions may be produced by such a method of treatment is questionable.

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EDITORIALS

The A.M.A. and the Rich Report

By now most physicians in California have heard of the Rich report. This report which has to do with the public relations survey of the A.M.A. was made at the request of the Board of Trustees of the Association early in 1946 by Raymond Rich and Associates of New York City.

At the meeting of the House of Delegates of the A.M.A. in July, 1946, in San Francisco, it was anticipated that the report would be made available to the members of the House of Delegates. Instead, a concise interpretation of it by the Board of Trustees was presented to the House of Delegates while actual copies of the report were not made available despite numerous requests for them. It seemed most unfortunate and surprising that the legislative and policy setting body of the A.M.A. was denied access to the results of this thorough study of public relations aspects of the A.M.A.

In the interval of the past five months for various reasons there has been a change in attitude and at the meeting of the House of Delegates of the A.M.A. in Chicago, December 9th to 11th, 1946, the Rich report again was the principal concern of the House. At the opening session of the House a copy of the Rich report was presented to each delegate along with a copy of the report of the special committee to consider the Rich report appointed by the Speaker upon the direction of the House at the July meeting in San Francisco.

The Rich report itself is copyrighted by the A.M.A. It is, therefore, not reproduced in CALIFORNIA MEDICINE. As much of it as we may reproduce, as well as the report of the Committee of the House of Delegates, which studied it, will be presented as soon as the necessary arrangements have been made.

The committee accepted most of the recommendations of the report and recommended adoption or approval of them by the House. Some of the recommendations were altered in impor-

tant aspects, but in most instances the alterations were inconsequential.

In many particulars this report was in some degree critical of the activities of the A.M.A. but the major portion of it was composed of constructive suggestions to strengthen all the public relations activities of the Association. In fact many of the changes recommended by Mr. Rich have already been implemented by the Board of Trustees, and in the adoption of the Committee report by the House of Delegates approval was given to the parts of the program already inaugurated. Mr. Charles Swart has been appointed Executive Assistant to handle public relations activities of the A.M.A. under the direction of Dr. George Lull, Secretary and Manager.

The major controversy regarding the report pertained to the National Physicians Committee (N.P.C.). Mr. Rich was rather severely critical of the value of this organization to the A.M.A. He stated that his investigation had shown that some N.P.C. activities had resulted in criticism from many sources. He therefore felt that approval of a part of this organization by the A.M.A. should not be renewed and that any interlocking of the directors of the two organizations should be terminated.

The committee recommended no action relative to these aspects of the N.P.C. because of the controversial nature of the subject and the meager information on which Mr. Rich's conclusions were said to be based. It recommended further study of these matters and was instructed to continue its investigation and to report to the House of Delegates in June, 1947.

Dr. Edward Cary and others made a spirited defense of the N.P.C. and Dr. Cary and Dr. Fishbein accused Mr. Rich of having reached his conclusions with reference to certain features of the report without adequate investigation and in certain instances without any investigation.

Mr. Rich had no opportunity to reply to these accusations before the House. It is hoped that he will be called before the House of Delegates at the session in June, 1947, to substantiate or disprove the accusations made against him.

Only after such a procedure can the House reach a final opinion as to the proper position of

the N.P.C. in the field of public relations of the A.M.A.

The net result of the acceptance of the Rich report as amended by the committee of the House of Delegates will be to strengthen the A.M.A., improve its efficiency and place its public relations in the hands of competent, trained personnel.

Encephalitis in California and the Pacific Area

During the past decade practicing physicians and public health personnel in California have very rapidly and progressively become more conscious of the human encephalitis problem. Among the other infectious diseases "virus pneumonias" alone have bid for equal or greater increase in attention. This growing interest in encephalitis has been due, in part at least, to a large number of closely related local research developments: isolation of the virus of equine encephalomyelitis from horses and later from man, provision for virus neutralization and complement fixation tests for diagnosis, isolation of the virus from naturally infected mosquitoes, notably *Culex tarsalis* and from other species, its experimental transmission by this and other species, and epidemiological studies implicating birds as a source of mosquito infection. During this same time, the St. Louis encephalitis virus was also suspected of playing a role in human infection within the state, and this second virus was eventually isolated within California from *Culex* mosquitoes (*Culex tarsalis*) which were also shown to be capable of transmitting the virus, and of acquiring it from infected birds. Finally, last year, this virus was isolated from a human brain. All these discoveries were made or confirmed from materials collected in the San Joaquin Valley by research workers at the Hooper Foundation of the University of California, except for the isolation of St. Louis virus from man, which was made by workers at the Virus and Rickettsial Research Laboratories of the California State Health Department where research of this nature was just beginning. The State Laboratories have also recently instituted a state-wide serological diagnostic service. Such a service had previously been conducted on a smaller scale by the Hooper Foundation.

We cannot determine when human encephalitis became an important disease in the Central Valleys of the State, for its season coincides with that of poliomyelitis, and we know that prior to the development of virus laboratory tests, encephalitis was usually diagnosed as poliomyelitis. Even now, when its presence is suspected and the clinical manifestations more readily recognized, the differential diagnosis in mild cases—and even in some severe ones—remains a very difficult problem. Available statistics, therefore, are of no practical value in its study. Another complicating factor in the consideration of reported cases is that this disease is reportable only as "infectious encephalitis," an outmoded name

having no specific etiological significance. Although we recognize that the two arthropod-borne virus encephalitides mentioned above can be acquired only during the hot summer season in some of the valley areas where there are very high sustained temperatures and prolific breeding of certain types of mosquitoes, we have many cases of "infectious encephalitis" reported during all months of the year from all areas—valley, coastal and mountain. These reports include many types of encephalitis. By performing specific laboratory tests on a selected group at the cost of several thousand dollars each year, only about 25 to 50 cases are proven to be due to these two known viruses. However, there is presumptive evidence of from 100 to 1,000 cases a year in the Central Valleys alone. Case fatality rates average from 5 to 20 per cent, and a small proportion of survivors suffer permanent mental or motor injury. Of these a high percentage require life long institutional care. Many of these infections may not be caused by one of the recognized viruses. In fact, sera from a large number of those patients with an illness resembling the St. Louis or Western equine type clinically, fail to give a positive reaction with either of these viruses. Nor can the patients be shown to be infected with poliomyelitis virus. A new virus which may be responsible for some of the cases has now been isolated repeatedly from mosquitoes from Kern County. The presence of other viruses there is suspected. While the encephalitis problem is obviously highly important, it is extremely difficult to quantitate.

Since it has now been well established that certain of these infections are maintained by mosquito transmission, usually from bird to man (there is good evidence which suggests that man and horses are not infectious to each other) the problem of the control of encephalitis has assumed a fairly definite form. Since human morbidity rates are so much lower than those of horses, protection by vaccination has not been recommended as a method of group control. Moreover, vaccine is only available for one of the types known to be present. With control of an enormous bird population obviously impossible, mosquito control is indicated as the first line of defense.

Recognizing the importance of mosquito control for both malaria and the encephalitides, the State Health Department requested funds for mosquito control from the State Legislature. In

1945 \$600,000 was allocated for research and control measures. This is another step in leadership for California, for these funds were the first from any state to be appropriated for encephalitis control.

Meanwhile, the Army, Navy and the United States Public Health Service have been cognizant of the encephalitis problem in the Pacific Area. The Public Health Service and the State of California have been aware of the possibility of malicious or accidental introduction into this state of the more highly fatal Japanese B virus. Research on this virus during the war had been conducted at the Hooper Foundation, as well as at several other laboratories, under Army and O.S.R.D. contracts. The Army and Navy had prepared an experimental vaccine which was finally given to over 20,000 on Okinawa in August, 1945, when an epidemic among natives involved our troops and resulted in several casualties. Hooper Foundation epidemiologists serving as Army consultants were flown to Okinawa and assisted in studying the outbreak. Because of the lateness of the season, and the thoroughness of mosquito control measures which had been instituted at the very outset of the epidemic, little could be learned of conditions existing previous to the outbreak.

During the following winter and spring, one of the same investigators, with other scientists, was again requested to serve with the Army in Japan to initiate research, confer with Japanese scientists and make recommendations for the control of the disease among American troops in the Pacific and the Orient during the summer of 1946. Recommendations were made for vaccination of all troops and American civilians, and *Culex* mosquito control about cantonment areas in certain countries and islands. Later, a California engineer from the staff of the University of California School of Public Health was flown to Japan to advise on effective mosquito control measures. Routine vaccination was performed in Japan, Okinawa and Korea.

It had been shown experimentally that at least five species of California mosquitoes could transmit Japanese B virus in the laboratory, and since similar types of experiments conducted with dengue virus proved negative, attention was focused on malaria and encephalitis prevention insofar as California was concerned. The United States Public Health Service, together with the Army and the Navy established careful mosquito

control programs about air fields where planes from the Pacific were landing, and careful inspection and spraying of planes was instituted at several of the island stops. In addition to these precautions, both State Health Department and the United States Public Health Service encouraged, supported and participated in the local research programs. They realized that should an exotic virus be imported, knowledge pertaining to its control and that of other viruses of a closely related group would be of the greatest value. Suitable mobile equipment and large stock piles of DDT were accumulated to meet any emergency which might arise. The State Health Department conducted research in certain areas, and contracted with the Hooper Foundation to extend their studies which were then being carried out with funds from the National Foundation for Infantile Paralysis and the United States Army. United States Public Health Service personnel were assigned to the State Health Department, and some of these in turn to the Hooper Foundation.

Thus, California has taken a leading role, not only in its own domestic encephalitis control problem (a problem as vital in certain other Western States) but research from this state has been applied to problems of the War in the Pacific, and in preventing the introduction of exotic viruses into California and other Western states. This is an example of planned and organized correlated efforts of the State University (with assistance from the National Foundation for Infantile Paralysis, the Army and the Office of Scientific Research and Development), the California State Health Department and the United States Public Health Service. Fortunately, in all probability thus far, no new virus has been introduced, and no serious extension or unprecedented outbreak of the local infections has occurred. Unfortunately, for the credit to be given to the services of research and preventive public health, there is absolutely no way to measure what undesirable conditions have been avoided. Public Health practice as it applies to disease prevention lacks the dramatic appeal of curative practice—especially among the laymen. An epidemic stopped short in its furious onslaught has great publicity value, but the control of an endemic situation, or an epidemic completely prevented, though actually a greater accomplishment receives no public acclaims.

WHAT? AGAIN?

With another session of the California Legislature scheduled for next January the question again comes up—Are we to have another drive for anti-vivisection legislation? Only the proponents of such legislation could adequately answer such a question but there are some signposts which may point to the prospects for 1947.

First of all, we must remind ourselves that various people of good intent and considerable

estate have died over a period of years and have bequeathed capital funds to professional societies as trust funds to provide income to promote anti-vivisection laws. Such funds lie idle for a period of years while the income from them accumulates to proportions which make possible a full-fledged professional fight for anti-vivisection legislation. There has not been such a fight in California for about eight years now, and unless

the reduced interest rates in the money market have cut down the income, it is possible that the fighting funds of such societies are now large enough to finance another battle.

Next, we must look at the recent record of such legislative attempts. An anti-vivisection bill was brought up in Congress to cover the District of Columbia. It was defeated. Then a more ambitious bill, backed by the Hearst press and employing all the old-time showmanship of untruths and half-truths, was placed before the New York State Legislature. This one took a lot of beating but beaten it was, thanks particularly to the Medical Society of the State of New York. Following its defeat the Hearst press in other cities took up the cudgels and we have had some rather recent examples in California units of the Hearst empire of the lengths to which journalism may be stretched in supporting anti-vivisection.

More recently there have been two outstanding articles on this subject in national magazines. Bernard DeVoto, writing in *Harper's Magazine*, has stripped the mask off the professional anti-vivisectionists, exposing them as professionals whose real function is to keep the pot boiling but never boiling over. They spend the accumulated funds of the sincere but misguided do-gooders,

retaining for themselves the professional status which permits them to benefit by such funds, meanwhile making sure that anti-vivisection laws do not finally pass and thereby do the professionals out of a job. Mr. DeVoto gives an excellent analysis of this situation, one which no thinking person can read without knowing who are really the best friends of man's best friend.

The second public article first appeared in *Hygeia*, and later, in digest form, in *Reader's Digest*. Written by Albert Q. Maisel and entitled *Operation X*, it describes the secrecy surrounding animal experimentation for processes which went a long way toward establishing the record low death rate in World War II. The secrecy was needed because the anti-vivisectionists were ready to pounce on any animal experimentation known to them, even though it was for the benefit of their own sons and daughters in the armed forces.

These articles point up the need for renewed vigilance by the medical profession. Outstanding arguments against anti-vivisectionists in themselves, they may indicate the proximity of renewed drives here and elsewhere by the professional animal-lovers. Possibly they may be pointing to another California episode in the old battle of dogs versus babies.



Clinical-Pathological Conference†

Case History: A retired business man, aged 63 years, entered the hospital with complaint of dry hacking unproductive cough of six months' duration and with increasing dyspnea of four months' duration. The patient was transported by plane and during the trip was markedly dyspneic, requiring oxygen. There had been a weight loss of 22 pounds in the preceding six months.

The patient had a history of cerebrovascular accident three years previously and anterior myocardial infarctions three years and one year previously. During this latter episode he had unexplained hematuria on several occasions. Five years before entering the hospital he had been treated for duodenal ulcer.

Physical Examination: On admission to hospital, the patient's temperature was 37.2°, pulse 116, respiration 40, blood pressure 160/92. Patient was an apprehensive, moderately obese individual, pale and markedly dyspneic, requiring continuous oxygen by nasal catheter. The thorax was symmetrical and resonance was slightly impaired over both bases posteriorly, greater on left. Slight impairment to percussion was noted below the right third rib anteriorly. There were numerous fine dry crackling rales over the right side of chest below the second rib. Medium coarse rales and high-pitched ronchi were present over the left side of chest anteriorly and over both lower lobes posteriorly. Rales were unchanged post-tussively. The heart was not enlarged; there was sinus tachycardia, and the tones were of fair quality, without murmurs. The remainder of the physical examination was negative except for tenderness and a questionable mass in the epigastrium.

Laboratory Examinations: Hemoglobin was 14.5 gm., RBC numbered 4,430,000, WBC 12,900 with 86 per cent neutrophils (3 per cent nonfilamented), 9 per cent lymphocytes, 4 per cent monocytes and 1 per cent eosinophiles. Specific Gravity of the urine was 1.010; it contained no albumen, casts or red cells. The sedimentation rate was 40 mm. in one hour (Westergren). The blood serology was negative. A coccidioidin skin test was negative, while a tuberculin patch test was faintly positive. The sputum was mucoid and scant in amount and when examined both by wet mount and by paraffin section, it contained no neoplastic cells, nor fungi. The specimen was composed chiefly of mucus with numerous polymorphonuclears and many masses of bacteria surrounded by cellular debris and resembling "salivary corpuscles."

A bedside film of the chest showed diffuse soft parenchymal infiltration throughout both lungs, somewhat confluent in the middle third of each lung field. The infiltration was patchy in type.

The trachea was deviated toward the right as were the heart and mediastinal structures. The dome of the right diaphragm was somewhat elevated.

Course: The patient's dyspnea continued severe with respiratory rate of 35 to 40, pulse 100-120. The temperature was 37.2° to 37.8° and terminally 38.3°. Under general supportive therapy, continuous oxygen inhalation and mild sedation, the patient steadily declined and expired on the eighth day of hospitalization.

Clinician's Discussion*: The predominant symptom this patient presented was dyspnea of long standing and of increasing proportions, proceeded by a dry hacking cough. Referring to the brief past history, we first think of congestive heart failure as the primary reason for hospitalization, as an aftermath of coronary occlusions which he had had three years and one year previously. We know that the patient had generalized arteriosclerosis as well as coronary sclerosis as evidenced by his blood pressure of 169/92, and a history of cerebrovascular accident three years previously, and probably a renal infarction one year previously. However, this patient was not suffering from congestive heart failure. He was not cyanotic in spite of dyspnea; his lungs were not wet; he did not have edema of the ankles on admittance, his heart was not enlarged. The picture was not that of a terminal phase of cardiovascular renal disease with both cardiac and renal failure. The urine was negative. One wishes that levels of NPN or Urea Nitrogen in the blood on admission to the hospital were included in the laboratory findings.

In an effort then to arrive at a diagnosis, we think of many things and rule them out one by one. **Advanced Tuberculosis:** This may cause dyspnea, far out of proportion to the findings. We can rule this out because the cough is non-productive, the sputum was mucoid and free from tubercle bacilli, the tuberculin skin test was only faintly positive and the x-ray findings were not those of tuberculosis. **Coccidioides:** The patient was flown in by plane, suggesting that he was brought from an isolated area in one of the rural districts, and of course in California one thinks of Coccidioidal infection. However, this patient's skin test was negative. Then, too, the x-ray findings were not suggestive of Coccidioidal infection.

We of course must include *pneumonia* or *pneumonitis* in the general picture. We rule out these at once as the primary cause of the disease because of the long standing history and because the temperature elevations were not high enough, the cough was non-productive over a long period of time and the x-ray findings were not typical.

† From St. Vincent's Hospital, Los Angeles.

* Clinician: Robert B. Hope, M.D.

What, then, does this lead us to? We have an individual who, though he is still obese, has lost 20 pounds in six months. He does not have tuberculosis; he does not have lues; he does not have congestive heart failure. He was treated for duodenal ulcer five years ago. We do not know whether existence of an ulcer was proven by x-ray; we do not know if his symptoms had completely subsided; we do not know if there has been an x-ray check to prove that the ulcer was healed. Aside from the pulmonary physical findings, the remainder of the examination was negative except for tenderness and a questionable mass in the epigastrium.

What, then, could best explain the symptom complex? Carcinoma involving the lung? Dyspnea is one of the earliest and most common symptoms and may occur out of all proportions to the amount of damage done or to the physical findings. Dyspnea is usually constant as in the case of this patient. If there is some degree of atelectasis, the dyspnea might be augmented. That this was quite possible is borne out by the fact that there was a deviation of the trachea, heart and mediastinum to the right. The physical findings that are recorded are entirely consistent with carcinoma of the lung. The tender epigastric mass could represent metastatic involvement of the liver. Since the dome of the right diaphragm was somewhat elevated, carcinoma of the stomach was more likely than primary carcinoma of the liver.

Other sources must be considered. The bleeding that was noted in the urine one year previously when the patient had his last coronary occlusion might be indicative of significant disease in the kidneys. However, I feel that it is more likely that this would be explained on a basis of a renal infarction, and I feel that the fact that the patient was treated five years previously for supposedly benign lesion in the upper gastrointestinal tract is quite important in his

history. A very rapid sedimentation rate would fit in with carcinoma. The story of the patient's progress, fever, elevated white count, the findings of masses of bacteria grouped around the white cells in the sputum, leads me to postulate a secondary terminal infection of pneumonitis which hastened death. So, in summing all things up, I think we can make a diagnosis of:

1. Carcinoma of the lung, metastatic with a superimposed terminal secondary pneumonitis, the carcinoma probably secondary to a gastric or duodenal lesion.

2. Generalized arteriosclerosis with healed myocardial and renal infarctions.

*Pathologist's Discussion:*** The patient's lungs were almost solidly infiltrated by innumerable small irregularly shaped metastases which were white in color. There did not appear to be enough uninvolved lung to permit the patient to breathe as long as he did. The primary tumor measured 4 x 3 x 2.5 cm. and occupied the lower pole of the right kidney, deforming the lower calyx. The renal tumor was bright yellow in color and in all respects a typical renal adenocarcinoma. The only other metastases were to the mediastinal nodes, enlargement of which produced the deviation of the trachea.

There was a well healed duodenal ulcer present just below the pylorus. There were several old fibrotic scars in the myocardium and an old thrombosis with complete occlusion of the circumflex branch of the left coronary artery.

Hematuria, as in this case, may be the only symptom pointing to a carcinoma of the kidney and it is not unusual to have the episodes of hematuria separated by months or years. Hematuria is said to be present in 60 to 80 per cent of all cases of carcinoma of the kidney and to be the initial symptom in 60 per cent.

** Pathologist: James E. Kahler, M.D.



CALIFORNIA MEDICAL ASSOCIATION

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FOR COMPLETE ROSTER OF OFFICERS, SEE ADVERTISING PAGE 4

NOTICES AND REPORTS

The Cancer Clinic Program*

The questions that most frequently come to the California Division of the American Cancer Society and the Cancer Commission of the California Medical Association relate to some phase of the Cancer Clinic program. The inquiries are for information concerning the organization and financing of new cancer clinics, the kind of service rendered in such clinics and the general policies of their operation. *The California Bulletin of Cancer Control* sets forth five of the most frequent questions and undertakes to answer them.

1. What is the relationship of the American Cancer Society to Cancer Clinics?
2. What is the relationship of the Cancer Commission of the California Medical Association to Cancer Clinics?
3. What are Cancer Clinics?
4. What are the policies for fund allocations to Cancer Clinics?
5. How may the American Cancer Society assist Cancer Clinics in cities where there are two or more such clinics?

1. *What is the relationship of the American Cancer Society to Cancer Clinics?*

The American Cancer Society by its campaign publicity is committed to rendering financial assistance when needed to Cancer Clinics approved by the American College of Surgeons and also "Detection Clinics." Neither the American Cancer Society nor any of its state divisions or county branches will own or operate a Cancer Clinic.

The Cancer Clinic is a function of the medical staff of a general hospital or medical school. In rare instances, the Clinic may be operated by a state or county medical society. It is only Clinics which are operated in this manner that have the approval of the American College of Surgeons.

There are many Cancer Clinics that can improve their service to the patient if they had more secretarial, nursing, or social service personnel. There are Clinics that could expand the work which they are doing if they had additional personnel, instruments, supplies, records or follow-up system. The program of the American Cancer Society includes financial assistance to these Cancer Clinics as may be needed for their maintenance or for increased activity.

There is need and room for new Cancer Clinics in

many of the hospitals in California. When and if the staff of a hospital decides to organize a Cancer Clinic, the American Cancer Society will help to supply the funds necessary to open that Clinic and to provide the necessary personnel to keep it operating. A Cancer Clinic in any hospital is optional with the staff of the hospital. While the American Cancer Society may encourage a hospital to organize such a Clinic, the province of the American Cancer Society is to help finance the project and to supply voluntary workers where needed.

The American Cancer Society will also help to finance Cancer Detection Centers. As recognized by the California Medical Association, the Cancer Detection Center is operated by a medical school, an approved hospital, or a county medical society. These Centers cannot be self-supporting in their initial years and do the work that is expected of them. As far as possible, the California Division of the American Cancer Society will supply funds toward their operation and maintenance. Members of the county branches can be very helpful in acting as volunteer workers in these Centers when they are established.

The relation of the California Division and county branches of the American Cancer Society to Cancer Clinics is that of giving encouragement, moral support and financial aid for their maintenance and of supplying voluntary workers if needed.

2. *What is the relationship of the Cancer Commission of the California Medical Association to Cancer Clinics?*

The Cancer Commission and the County Cancer Committees of the California Medical Association act only in an advisory capacity. Each cancer clinic is autonomous and operated by the staff of the hospital. The formation of a cancer clinic is optional with the hospital medical staff.

The members of the Cancer Commission and its Executive Medical Director will encourage the formation of Cancer Clinics and will be glad to visit and advise in the establishment and operation of Cancer Clinics when invited to do so.

In order to justify the expenditure of public funds, it seems necessary that Clinics requesting such funds should meet a minimum standard. The Cancer Commission has set up minimum standards for Cancer Clinics to guide in the formation of new Clinics and as a basis of approval for financing by the American Cancer Society. Similar standards for "Detection Clinics" have been adopted by the California Medical Association as

* Reprinted from the California Bulletin of Cancer Control.

a basis of approval for Cancer Detection Centers in this state.

3. What are Cancer Clinics?

The American Cancer Society recognizes four different types of organized cancer work:

1. The Cancer Information Center.
2. The Cancer Detection Center (or Detection Clinic.)
3. The Cancer Clinic in a general hospital.
4. The Cancer Hospital.

1. *Cancer Information Center.* The Cancer Information Center will ordinarily be the office of a county branch of the American Cancer Society in larger cities. In smaller communities, it may be the residence telephone of one of the officers of a county branch of the Society. The purpose of the Center is to be a clearing house for lay education in cancer. Persons applying to this Center for advice will be referred to physicians or clinics as directed by the policy of the local county medical society. This will be described in a later bulletin.

2. *Cancer Detection Center.* Many other names have been proposed for this activity such as Cancer Prevention Clinic or Cancer Detection Clinic, but the present designation of the American Cancer Society is the one given above.

The Cancer Detection Center is operated in a hospital or medical school, or as an Out-Patient Department of a hospital or medical school. A Detection Center may be operated by a County Medical Society. The purpose of the Detection Center is to examine presumably well persons who have not sufficient symptoms to send them to a physician in order to discover or eliminate early cancer or other chronic diseases.

The procedure in the Center consists of a complete physical examination by physicians in the Center and certain laboratory tests. This is purely a screening examination to discover early cancer before it causes symptoms. If abnormalities are found the patient is referred to his own private physician with a report of the findings. If the patient has no physician, he is referred to a physician or clinic as directed by the county medical society.

Note: In his own private practice every physician's office can be or can function as an Information Center; many physicians' offices can function as Detection Centers.

3. *Cancer Clinic in a General Hospital.* The Cancer Clinic or Tumor Clinic is an organized department of a hospital staff which meets regularly to examine cancer patients and to consider their diagnosis and management. The term "cancer patient" refers here to any patient having or suspected of having malignant disease. To more accurately describe this service in private hospitals, the Cancer Commission designates such clinics as Cancer Consultation Clinics. The group of doctors that conducts such a Clinic is designated as a Tumor Board.

The Tumor Board consists of one or more surgeons, gynecologists, pathologists, radiologists, internists, and consultants from the other specialties dealing with cancer. Each patient coming to the Clinic is examined by members of the Board and the case is presented to the entire Board for discussion. Thus each patient has the benefit of the combined judgment and experience of the group of doctors interested in cancer. After being presented to the Board, each patient is returned to the referring physician with a report of the findings and recommendations for treatment.

The Cancer Consultation Clinic thus offers to all the doctors in the community an opportunity to obtain a group consultation on their cancer patients to facilitate early diagnosis and determine the indications for treatment.

In most cases, the Cancer Consultation Clinic will only accept patients referred by a private physician. A variation from this procedure will be recognized only if approved by the county medical society. The Clinic is open to all referred patients regardless of their financial status. It is the object of the Clinic to extend this consultation service as widely as possible to all physicians in the community, and to their cancer patients. The Cancer Consultation Clinic does not treat cancer patients but seeks to determine the diagnosis and outline the most adequate treatment for each case. In Clinics that accept patients who were not referred by physicians, the patients will be referred to their own physician for treatment if they have one. Patients that do not have a private physician will be referred for treatment to members of the staff of the hospital or to a panel of physicians approved by the County Medical Society.

All members of the hospital staff are urged to attend and participate in the meetings of the Tumor Board. The doctor referring the patient is requested to take part in the discussion. All licensed physicians are welcome to attend these meetings.

Note: The Cancer Clinic and the Cancer Detection Clinic should be conducted as two separate entities. They may be conducted in the same place and with largely the same personnel, but they have an entirely different function, different records and a different bookkeeping system. It will be confusing and inefficient to try to combine these two activities.

4. *Cancer Hospital.* There are no Cancer Hospitals in California. When a Cancer Hospital is established, it should conform to the minimum standards of the American College of Surgeons and it should be operated in close cooperation with the county medical society and a Class A medical school.

4. What are the Policies for Fund Allocations to Cancer Clinics?

The California Division of the American Cancer Society will consider requests for funds from established Clinics in order to extend their work or to increase their efficiency, and from new proposed Clinics. Ordinarily, such requests will be for secretarial, nursing, social service, or follow-up workers and for instruments and supplies. Requests would also be considered for special laboratory examinations or x-ray studies on patients who are unable to pay for them. An officer of the Clinic will fill out and present the formal request for funds to the local county branch of the American Cancer Society. When this request is approved by the county executive committee and the county medical society, the request is forwarded to the State Commander of the California Division. The request will be investigated by the executive committee of the California Division and upon approval, funds will be advanced for the project requested.

The California Division is also prepared to help finance Cancer Detection Centers that meet the minimum standards of the California Medical Association. When the formation of such a Detection Center is contemplated, the State Commander should be notified in advance to avoid any misunderstanding as the California Division will hesitate to supply funds to Detection Centers which do not have the promise of permanence and stability or if they will be unable to meet the required minimum standards.

The California Division will not be able to allocate funds to a Cancer Clinic in a tax-supported hospital. These funds should not be used for service to patients who are already provided for by the state law and whose care is a legitimate charge against the city or county tax budget. If the consultation service of the Cancer

Clinic in a county or city hospital is available to non-indigent cases, then the California Division will consider an allotment toward the support of the Clinic.

5. *How May the American Cancer Society Assist Cancer Clinics in Cities Where There Are Two or More Such Clinics?*

In the larger hospital, particularly in teaching centers, the Cancer Consultation Clinic will require full-time assistants. In such locations the California Division will consider requests to finance the necessary additional assistants that are not provided for by other funds. On the other hand, in smaller cities with a single Cancer Clinic having relatively few patients, a single part-time worker may serve in different capacities, e.g., as social worker and nurse. This may be the only assistant that is needed and her salary may be requested from the California Division.

In some of the larger cities where there are two or more Cancer Clinics, all these clinics could be served economically and efficiently by one full-time Cancer Clinic Team attending each clinic in rotation. This team will provide for records, reports and follow-up of all of the clinics on a uniform program. Such a "Cancer Clinic Team" (Secretary, Nurse, Social Worker Team) can be employed with funds from the American Cancer Society and can serve the Clinic in each hospital as a neutral, impartial agency.

Each Cancer Consultation Clinic within a reasonable distance should be invited to participate in this program, but whether or not any individual Clinic would use the services of the Cancer Clinic Team would be optional with that Clinic and the Hospital management. Where such a Cancer Clinic Team is provided, the members of the team would be employed by the county branch of the American Cancer Society after consultation with the

Chairman of each Tumor Board which the team serves. The organization of this program and the activities of the Cancer Clinic Team would be subject to continuous approval by the county medical society and the executive committee of the county branch of the American Cancer Society.

It is recommended that the Cancer Clinic Team work out of the office of the county branch of the American Cancer Society. The secretary, accompanied by the nurse and social service worker, would travel from one clinic to another on the appointed days and would be responsible for the following:

Copy for conference, notifications to staff members, recording of recommendations of the Tumor Board, checking and recording all findings and recommendations, transmissions to physicians, maintenance of files, forwarding of microscopic slides of each case to the Tumor Registry and arranging of follow-up for all patients. All the actual stenographic work would be done in the central office and files maintained there for reasons of centralization and statistical study. Complete copies of the records of every patient would be transmitted to the hospital for its Clinic file, to the Tumor Registry files and also to the referring physician. The services of the trained nurse and the social worker might also be available for home visits when they were not participating in the Clinic functions.

Working out of the office of the county branch of the American Cancer Society this "Secretary, Nurse, Social Worker Team" would be available to share the activities of the office and of the Cancer Information Center, meeting callers seeking information and answering telephone calls for medical inquiries. With such a central, unified group, the potentialities for liaison between the public and the medical profession on the cancer problem are great.

Program of Associated Medical Care Plans Expected to Benefit C.P.S.

A broadened medical care service for members of California Physicians' Service and greater inducements for enrollment of employees of large businesses are expected to grow out of a program outlined by Associated Medical Care Plans at its first meeting which was held in Chicago, October 4-5. Benefits to C.P.S. would be concomitant with a strengthening of the position of all medically sponsored plans for prepaid medical care under the A.M.C.P. program.

Set up as a national coordinating agency for approved medical care plans, the organization, following its meeting, announced five immediate objectives:

1. To establish reciprocity agreements among all medically sponsored prepaid medical plans in the United States so that a beneficiary under any of the plans will have access to medical care even in areas outside the one covered by the organization in which he has membership.

2. To set up national enrollment facilities which will assist in the enrollment of large businesses whose employees are scattered throughout the nation.

3. To secure the complete cooperation of every medically sponsored prepayment plan in the United States.

4. To develop a symbol and publicize it so that it will be recognized everywhere by the American people as the symbol of prepayment medical care programs sponsored by the American medical profession.

5. To organize an adequate public relations program on a national level which will aid in rapid development and growth in membership for the prepayment plans.

Frank E. Smith, who had been serving as director of

the department of professional relations in Los Angeles for California Physicians' Service, was elected at the October meeting to serve as the first director of Associated Medical Care Plans. He took over that full-time post, with headquarters in Chicago, December 1.

Formation of policies and programs of A.M.C.P. is in the hands of a commission whose members were chosen from among the representatives of 29 medical care plans forming the Association.

In addition to the appointment of Mr. Smith as director, the election of William A. Bowman, executive director of California Physicians' Service, to the vice presidency of the A.M.C.P. commission is looked upon as substantial recognition of the efforts of organized medicine in California in setting up and promoting a plan for voluntary prepaid medical care.

Besides Mr. Bowman, the membership of the commission is Dr. L. Howard Schriver, president of Ohio Medical Indemnity, Inc., president; Jay C. Ketchum, Michigan, secretary; Dr. Norman M. Scott, New Jersey, treasurer; Dr. A. W. Adson, Minnesota; Dr. E. J. McCormick, Ohio; Dr. R. L. Zech, Washington; Dr. E. P. Hayden, Massachusetts; Dr. B. A. Nelson, Kansas; Dr. A. N. Offerman, Nebraska; L. H. Perry, Pennsylvania; and E. M. Kingery, Iowa.

At a meeting of the commission in Omaha, November 13-14, Mr. Smith told the A.M.C.P. governing body that "latest reports indicate that 73 medically sponsored plans are now operating in 33 states."

Health Week Plans

During the first six months of 1947, the California Committee for Voluntary Health Insurance will conduct Voluntary Health Insurance Week campaigns in some of the largest and most important counties in the state.

Health Weeks have been staged in 25 counties to date, and by the end of June, 1947, 19 counties will be added to the total. Campaigns in the remaining 14 counties, smaller or less populous areas, will close out the year.

Lead-off county for 1947 will be Sacramento which has been scheduled for January 20-25 while the Legislature is in session.

Other Health Weeks, dated to coincide with the sales efforts of California Physicians' Service, are as follows:

Kern, February 3-8; Alameda, February 17-22; San Diego, March 3-8; San Joaquin, March 24-29; Tulare, March 31-April 5; San Francisco, April 21-26; Riverside, May 5-10; Santa Clara, May 19-24; Los Angeles, June 2-7.

Campaigns are also planned for Tehama, Glenn, Colusa, Yolo, Sutter, Yuba, Butte, Imperial and Santa Barbara counties during the first six months of 1947. The exact dates will be announced early in 1947.

The California Physicians' Service 100-inch newspaper advertising schedule will be run in every newspaper and will extend over a three-week period in the weeklies and for two weeks in the dailies. Druggist, insurance and dairy tie-in advertising which showed a steady increase during 1946 is expected to produce even more gratifying results next year.

Radio will augment newspaper advertising in Sacramento, San Francisco, Alameda, San Diego and Los Angeles counties. Localized spot announcements and short dramatizations will be carried on many of the radio stations during these Health Week campaigns.

In Sacramento, plans for house-to-house delivery of the California Committee's "Fifth Column" pamphlet along with a California Physicians' Service folder will coincide with radio and newspaper publicity.

Since the Legislature will be in session, the California Committee may also stage an informal dinner in Sacramento for all the members.

In Los Angeles County, Health Week may be lengthened to Health Month. The campaign will probably be localized in each one of the eight medical council districts. This is expected to generate the maximum amount of cooperation and publicity as well as reach into the greatest possible number of businesses and homes.

Local, state and national publicity for voluntary health insurance and for C.P.S. has resulted from endorsements secured by the California Committee and with the teamwork of a number of persons in the medical profession and the organizations concerned.

The National American Legion, the California American Legion, the California State Chamber of Commerce, California-Nevada Kiwanis, the Los Angeles Chamber of Commerce, and the San Francisco Employers Council, to name a few, have gone on record as favoring voluntary health insurance and opposing compulsory legislation. In addition, nearly 50 chambers of commerce have taken similar action within the last four months.

As in the past, the California Committee will emphasize the need for doctor participation in the Health Week campaigns. In speeches before service clubs and in serving as key men in their communities, the physicians themselves can tell the doctors' story better than anyone else. Where physicians have participated, resulting publicity for C.P.S. and for voluntary health insurance has been particularly outstanding.

In Memoriam

Behrens, Charles Bernhardt. Accidentally killed while deer hunting near Cedar City, Utah, October 19, 1946, age 46. Graduate of the College of Medical Evangelists, Loma Linda, 1935. Licensed in California in 1935. Doctor Behrens was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.



Carney, Samuel David. Died at Pomona of a cerebral hemorrhage, August 30, 1946, age 68. Graduate of the Jefferson Medical College of Philadelphia, Pennsylvania. Licensed in California in 1944. Doctor Carney was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.



Glaser, Mark Albert. Died at Salt Lake City, Utah, November 2, 1946, age 49. Graduate of the University of California Medical School, Berkeley-San Francisco, 1923. Licensed in California in 1923. Doctor Glaser was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.



Gratiot, William Marcy. Died at Pacific Grove of coronary occlusion, May 10, 1946, age 69. Graduate of the Atlanta College of Physicians and Surgeons, Georgia, 1901. Licensed in California in 1921. Doctor Gratiot was a member of the Monterey County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.



Porter, James Arthur. Died at Visalia, November 2, 1946, age 60. Graduate of Northwestern University Medical School, Chicago, Illinois, 1912. Licensed in California in 1926. Doctor Porter was a member of the Stanislaus County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.



Saverien, Henry Ludwig. Died at Sacramento of a brain tumor, November 14, 1946, age 41. Graduate of the University of Southern California School of Medicine, Los Angeles, 1934. Licensed in California in 1934. Doctor Saverien was a member of the Sacramento Society for Medical Improvement, the California Medical Association, and a Fellow of the American Medical Association.



Simms, John Shaffer. Died at Hollywood, September 6, 1946, age 64. Graduate of Rush Medical College, Illinois, 1911. Licensed in California in 1924. Doctor Simms was a retired member of the Los Angeles County Medical Association and the California Medical Association.



Stewart, Aubon Earl. Died at Los Angeles, August 31, 1946, age 59. Graduate of the University of Manitoba Faculty of Medicine, Winnipeg, 1913. Licensed in California in 1924. Doctor Stewart was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

Council Meeting Minutes

Tentative Draft, Minutes of the 337th Meeting of the Council, California Medical Association

The meeting was called to order by Chairman Edwin L. Bruck, at 9:30 a.m., Sunday, November 10, 1946, at the Biltmore Hotel, Los Angeles.

* * *

1. Roll Call:

Present were President Sam J. McClendon, Speaker E. V. Askey, Vice Speaker L. A. Alesen, Councilors Cherry, MacLean, Shipman, Moody, Thompson, Regan, Johnston, Crane, Henderson, Kneeshaw, Bruck, Kindall, MacDonald and Green, Secretary L. H. Garland and Editor Dwight L. Wilbur.

Absent: President-Elect Cline, Councilor Anderson.

Present by invitation: Legislative Chairman Dwight H. Murray; C. L. Cooley, Secretary of C.P.S.; Edwin T. Remmen, Secretary of Los Angeles County Medical Association; Mr. Clem Whitaker, Public Relations Consultant; Mr. Howard Hassard, Legal Counsel; Mr. W. M. Bowman, Executive Director C.P.S.; Mr. John Hunton, Executive Secretary; Mr. William P. Wheeler, Assistant Executive Secretary; Mr. Frank Smith, Executive Director Associated Medical Care Plans, Inc.; and Executive Secretaries Frank Kihm of San Francisco County, Rollen Waterson of Alameda County, Joseph Donovan of Santa Clara County, and Kenneth Young of San Diego County.

* * *

2. Approval of Minutes:

(a) Minutes of the 336th Council meeting, held September 8, 1946, were approved.

(b) Minutes of the 19th meeting of the Executive Committee, held October 16, 1946, were approved.

* * *

3. Confirmation of Mail Vote:

On motion duly made and seconded, it was voted to confirm a mail vote of the Council approving an agreement reached between the Cancer Commission and the Cancer Prevention Society of Los Angeles.

* * *

4. Membership:

(a) A report of the membership as of November 7, 1946, was received.

(b) On motion duly made and seconded, 24 members whose dues had been received since September 8, 1946, were reinstated to active membership.

(c) On nomination by their county medical societies and on motion duly made and seconded, the following were elected to Retired Membership: G. W. Walker, Fresno County; J. R. Walker, Fresno County; Edward S. Fogg, Kern County; James Farrage, Orange County; Harry E. Zaiser, Orange County; Walter W. Fenton, San Bernardino County; Edward W. Twitchell, San Francisco County; George H. Rohrbacher, San Joaquin County; Charles H. Breuer, Santa Clara County; Arthur H. MacFarlane, Santa Clara County; Louis Mendelsohn, Santa Clara County; Edwin E. Porter, Santa Clara County; Jacob L. Pritchard, Santa Clara County; Charles E. Shepard, Santa Clara County.

(d) On nomination by their county medical society and on motion duly made and seconded, Doctors Dorothy Horstman and Marcus A. Krupp of San Francisco were elected to Associate Membership.

* * *

5. Financial:

(a) Reports of bank balances as of November 7,

1946, of income and expenditures for October and the ten months ended October 31, 1946, and of the balance sheet as of October 31, 1946, were received.

(b) The Executive Secretary suggested that surplus funds be used to purchase U. S. Treasury Bonds. On motion duly made and seconded, it was voted to make such a purchase.

* * *

6. Appointments:

(a) At the request of Doctor Dwight L. Wilbur, Editor, Doctor Walter E. Macpherson of Los Angeles was appointed a member of the Editorial Board of *California Medicine*, representing General Medicine.

(b) On motion duly made and seconded, the following committee was approved for appointment by the Chairman as a C.P.S. Fee Schedule Committee: W. L. Bender of San Francisco, Chairman; Harold P. Totten of Los Angeles, Francis E. Jacobs of San Diego, Frank B. Reardon of Sacramento, Wilbur L. Bailey of Los Angeles, Harry J. Templeton of Oakland, R. G. Frey of Red Bluff, Jesse Carr of San Francisco, Hugh T. Jones of Los Angeles, and Seth W. Sensiba of Santa Monica.

* * *

7. Advisory Planning Committee:

Mr. Hassard reported that the members of this committee had agreed to aid in the following up of compensation collection complaints from members and to publish in their bulletins information on claims procedure.

On C.M.A. legislative proposals, the committee recommended that no effort be made to secure a legal definition of medical indigency; that legislation should be sought to encourage voluntary prepayment medical care plans, and that a postpayment loan plan to provide funds for payment of medical care costs be approved provided loans for physicians' services were excluded.

On public relations, the committee suggested that a committee of the C.M.A. Council be appointed to work with the Advisory Planning Committee in establishing public relations programs in all county medical societies. On motion duly made and seconded, it was voted that Doctors Sam J. McClendon and L. A. Alesen be appointed members of a Professional Relations Committee to act in this manner.

Mr. Hunton reported that the information requested of the Medical Society of the State of California following the September 9 Council meeting had been requested on September 13 and that a mass of material in response to this request had been delivered to him on November 9. The matter was put over to the next Council meeting.

* * *

8. California Physicians' Service:

Doctor C. L. Cooley, C.P.S. Secretary, reported that 57,463 new members had been enrolled during September and October and that the commercial program membership as of November 1, 1946, was 352,726, compared with 170,000 on January 1, 1946. He stated that complaints from physician members had dropped to very small numbers.

On costs, he reported that the average cost per claim had increased to about \$24 from the earlier average of about \$17. Diagnostic costs are high, with x-ray and radium costs accounting for almost 20 cents of each dollar paid out by C.P.S. for professional services.

Doctor Cooley stated that C.P.S. dues had been in-

creased 25 per cent, that 2,000 of the 5,700 existing membership groups had already been notified of this increase and that practically no complaints had been received. Funds from the increased dues will start accruing on December 1, 1946. He also stated that a waiting period had been established before benefits for hemorrhoidectomies, tonsillectomies, herniotomies and a few other common surgical procedures would be available. The one-year waiting period on these procedures is estimated to reduce C.P.S. costs considerably.

Doctor Cooley stated that more than 10,000 members of the California State Grange had been enrolled under that contract and that the former Farm Security Administration contract was being allowed to expire in order to remove the confusion between the F.S.A. and the Grange arrangements. F.S.A. members are allowed to transfer into the Grange membership group at an added cost of \$1.30 per month for a family of three or more persons.

The Veterans' Administration contract is now running at a volume of \$250,000 monthly and the maximum volume is expected to be reached in about one year.

Mr. Bowman reported on the formation of Associated Medical Care Plans, Inc., by the American Medical Association, under the control of a commission of nine physicians and four lay administrators. He introduced Mr. Frank Smith, former C.P.S. public relations employee, who has been selected executive director of A.M.C.P.

* * *

9. Public Policy and Legislation:

Doctor Murray reported on the November 5 election, showing that California will now be represented in Congress by 14 Republicans and 9 Democrats five of the latter being considered conservatives. In the California Legislature, the Senate will have 28 Republicans, 11 Democrats and one vacancy. The Assembly will have 48 Republicans and 32 Democrats.

Mr. Hassard discussed the possible legislative program which had been discussed by C.M.A. officers following a visit to Sacramento. Together with this program he spoke of the comments of the Advisory Planning Committee on the three points under question. These are:

1. Assistance for the indigent.
2. Assistance for voluntary prepayment plans.
3. Assistance for self-employed persons not possibly coverable under points 1 or 2 above.

On point 1, possible legislation lies in a definition of medical indigency, following the definition given in the Goodall vs. Brite court decision. This would permit free choice of physicians in county hospitals and might provide state tax fund assistance to the poorer counties. The Advisory Planning Committee saw dangers in such legislation in lessening the powers of county boards of supervisors and recommended this point be eliminated from the C.M.A. program.

On point 2, there was general agreement that legislation similar to the present Oregon law which permits an employer to sign all his agreeing employees to a prepayment plan would be desirable.

On point 3, the suggestion was made that the state might establish a loan guarantee fund similar to Federal Housing Authority procedure. This fund would permit a borrower to secure up to \$2000 for the payment of medical care expenses, would limit the amount of interest to be charged by banks for such loans and would provide for verification of the soundness of the bills incurred. This legislation would require a constitutional amendment. On this point the Advisory Planning Committee felt that such legislation should be encouraged to cover hospital, drug, nursing and other bills but that the phy-

sicians' services should not be included for fear the doctors would be accused of attempting to secure a state guarantee of their accounts.

* * *

10. Public Relations:

Mr. Clem Whitaker reported a good majority in the Assembly and a smaller majority in the Senate considered favorable to the idea of voluntary health insurance. He reported on the progress of voluntary health insurance weeks, which so far have covered 25 counties and are scheduled to be held in Sacramento, San Francisco, Alameda and Los Angeles counties by June 30, 1947, as well as in many smaller counties.

He reported on the resolution adopted by the American Legion convention, condemning compulsory health insurance and approving voluntary health insurance. He also reported on a meeting between C.M.A. representatives and officers of the California Parent-Teachers Association, looking toward a more friendly relationship between the two organizations.

Mr. Whitaker stated that his expenditures in 1946 would be \$69,000 less than the 1946 budget.

On motion by Crane, seconded by Kneeshaw, a new budget for the first six months of 1947 was unanimously approved.

Doctor Askey suggested that the C.M.A. introduce into the A.M.A. House of Delegates a resolution calling attention to restrictive hospital regulations concerning staff department heads which limit such administrators to board licentiates and tend to make fewer hospital beds available for patients of general practitioners who are not diplomates. On motion by Kneeshaw, seconded by MacLean, it was voted to authorize Doctor Askey to contact the officers of the C.M.A. Section on General Practice and, through the C.M.A. office, county officers of similar sections, with the idea of preparing a resolution for consideration by C.M.A. Delegates to the A.M.A. for introduction into the A.M.A. House of Delegates.

* * *

11. Palo Alto Clinic:

Chairman Shipman of the Executive Committee reported on a meeting between representatives of the Palo Alto Clinic and Santa Clara County Medical Society on October 9, attended by Doctor Shipman and Mr. Hassard at the request of the Council Chairman. This meeting was called to discuss the Palo Alto Clinic contract with Stanford University and Doctor Shipman reported that little progress was made toward changing the previous situation.

Doctor Kneeshaw read a letter from Mr. Alvin C. Eurich of Stanford University and a letter from Doctor Herbert T. Browne of Palo Alto in which Mr. Eurich proposed and Doctor Browne opposed certain changes in the present contract. Doctor Kneeshaw stated this proposal had not been approved by the Council of the Santa Clara County Medical Society but that that Council had asked the C.M.A. Council to determine whether or not such changes would overcome the previous C.M.A. Council determination that the contract was in violation of certain ethical provisions. This proposal was turned over to C.M.A. legal counsel for further study and an opinion. On motion by Kneeshaw, seconded by Henderson, the matter was then referred to the Executive Committee for further action.

* * *

12. 1947 Annual Session:

Doctor Garland as Chairman of the Committee on Scientific Work reported on the plans for the 1947 meeting. Doctor Bruck presented requests for the dermat-

ological and genito-urinary sections requesting guest speakers in their specialties. With three guest speakers allowed each year, one invited by the section on medicine and one by the section on surgery, the third invitation being at the discretion of the Association president, Doctor McClendon signified his willingness to work with the Committee on Scientific Work in the selection of his guest speaker.

* * *

13. Blood Banks:

Doctor Bruck reported on meetings of the committee to study blood banks. The State Board of Health has agreed in these meetings to license blood banks and to

supervise the technical aspects of their operations. The American Red Cross is anxious to take over the complete blood bank program. Following Doctor Bruck's suggestion it was moved by McClendon, seconded by MacDonald and voted that the Association establish a Blood Bank Committee to work with the State Board of Health and the physicians of the state in establishing an area blood bank plan.

* * *

14. Time and Place of Next Meeting:

It was moved, seconded and voted that the next Council meeting be held in San Francisco on January 12, 1947.

Adjournment.

18 MORE VOLUNTARY MEDICAL CARE PLANS GET COUNCIL APPROVAL

Eighteen additional voluntary prepayment medical care plans, sponsored by state and county medical organizations, have been granted the seal of acceptance by the Council on Medical Service of the American Medical Association.

This approval gives the 18 plans, as well as the nine previously approved, the right to use the American Medical Association blue shield emblem on all official papers and on any promotional literature or display material.

More than 80 voluntary plans sponsored by medical organizations are now operating and E. J. McCormick, M.D., Toledo, Ohio, chairman of the Council, said applications for approval had been received from many of them and would be acted upon soon.

The 18 plans approved at a recent meeting of the Council's executive committee are:

Physicians Association of Clackamas County, Oregon City, Oregon; Hospital Service Corporation, Birmingham, Alabama; Florida Medical Service Corporation, Jacksonville; North Idaho Medical Service Bureau, Lewiston; Genesee Valley Medical Care, Rochester, N. Y.; Hospital Saving Association of North Carolina, Chapel Hill; Oklahoma Physicians Service, Tulsa; Coos Bay Hospital Association, Coos Bay, Oregon; Pacific Hospital Association, Eugene, Oregon; Klamath Medical Service Bureau, Klamath Falls, Oregon; Group Medical and Surgical Service, Dallas, Texas; The Dallas County Medical Plan, Dallas, Texas; Surgical Care, Inc., Roanoke, Va.; Medical-Surgical Service, Inc., Fairmont, W. Va.; Medical-Surgical Care, Inc., Parkersburg, W. Va.; the West Virginia Medical Service, Wheeling, and the Hospital Service Association, Oakland, Calif.

The nine plans originally approved are:

California Physicians' Service, San Francisco; Iowa Medical Service, Des Moines; Michigan Medical Service, Detroit; Surgical Care, Inc., Kansas City, Mo.; Nebraska Medical Service, Omaha; Medical-Surgical Plan of New Jersey, Newark; Ohio Medical Indemnity, Inc., Columbus; Medical Surgical Association of Pennsylvania, Harrisburg, and the Oregon Physicians Service, Salem.

At another session, the Insurance Committee of the Council on Medical Service, meeting with representatives of leading insurance organizations in America, cre-

ated two subcommittees—a committee on cooperation and a committee on rural enrollment. The purpose of the first is to enlist close cooperation among all voluntary groups for rendering health protection while the second subcommittee will study the best means of affording protection offered by the combined voluntary facilities to people in rural areas.

"The people of America can best obtain protection against the hazards of illness through voluntary health insurance plans," said A. W. Adson, M.D., Rochester, Minn., adding: "Through cooperation and understanding among physicians, voluntary medical care and hospital plan executives and insurance representatives can best provide this coverage for the American people without the interference, red tape and government control which would come with compulsory sickness insurance."

Besides Dr. Adson, members of the subcommittee on cooperation are James R. Miller, M.D., Hartford, Conn., a member of the board of trustees of the American Medical Association and Lester Perry, executive director, Medical Service Association of Pennsylvania, Harrisburg. Ex-officio members are Jay C. Ketchum, Detroit, executive vice president of the Michigan Medical Service and advisor to the Council; Frank Dickinson of the A.M.A. Bureau of Medical Economic Research, and Howard Brower, of the A.M.A. Council on Medical Service.

Members of the subcommittee to study voluntary health protection in rural areas are James R. McVay, M.D., Kansas City, Mo.; F. S. Crockett, M.D., Lafayette, Ind., chairman of the A.M.A. Committee on Rural Health, and L. S. Kleinschmidt, of the Council on Medical Service. Mr. Dickinson was appointed as ex-officio member.

Thomas A. Hendricks, Chicago, executive secretary of the Council, said that an invitation would be extended to the Blue Cross Commission of the American Hospital Association and the American Hospital Association itself to be represented on both committees.

Private insurance organizations will also be represented on both subcommittees. These will include representatives from the Health and Accident Underwriters Conference, the American Mutual Alliance, the Life Insurance Association of America and the Association of Casualty and Surety Executives.



NEWS and NOTES

NATIONAL • STATE • COUNTY

ALAMEDA

Dr. Theodore C. Lawson of Oakland has been elected president of the Alameda County Medical Association for the fiscal year ending November, 1947. Dr. Lawson, formerly vice-president, succeeds Dr. Warren B. Allen of Oakland. Dr. William Donald was elected vice-president, and Dr. Dorothy Allen was reelected secretary-treasurer. Elected to the house of delegates of the California State Medical Association were Drs. C. J. Atwood, Chesley Bush, Ergo Majors, William Reich, T. E. Reynolds, and Stanley Truman.

FRESNO

A new medical office has been opened in Dinuba by Dr. Victor Badertscher. Dr. Badertscher, a graduate of Western Reserve University School of Medicine, spent about four years in the Navy, serving in the southwest Pacific and in hospitals in this country.

LOS ANGELES

Dr. Adele R. Eiler has been appointed acting director of the bureau of maternal and child hygiene of the Los Angeles County Health Department. The appointment follows the retirement of Dr. Anna E. Rude, director of this bureau for the past 17 years.

Dr. Malcolm C. Todd has become associated with Dr. F. B. Settle in the practice of general surgery. Their offices are located in the Professional Building, Long Beach.

Dr. Carl Eno Lund, who formerly had offices in North Hollywood, has moved to 4402 Riverside Drive, Burbank.

Dr. Howard F. West, chairman of the medical advisory board of the Los Angeles County General Hospital, has been appointed medical director of the County Department of Charities. In the newly created position, Dr. West will have full responsibility for establishing and maintaining the medical policy of all hospitals under the jurisdiction of the County Charities Department.

RIVERSIDE

Dr. James B. Oliver and Dr. P. A. Staley have announced the association with themselves of Dr. William H. Elliott, Jr., in the practice of general surgery. The group occupies offices at 648 North Palm Canyon Drive, Palm Springs.

SACRAMENTO

The Sacramento County division of the American Cancer Society has announced the opening of a consultation clinic in the Sutter Hospital early in January. The consultation clinic, an organized department of the hospital staff, will meet regularly to examine cancer patients, including those having or suspected of having cancer, and to consider their diagnosis and treatment. The clinic will be conducted by a board consisting of one or more surgeons, gynecologists, pathologists, radiologists and internists, with consultants from other specialties dealing with cancer.

The Sacramento Medical Society will supervise the clinic, which will be open to all doctors in Northern California and to all patients regardless of financial status.

Dr. Godfrey Steinert, Mayor of Isleton, has moved into new offices which occupy the eastern section of the recently completed Lewallen Building in Isleton.

SAN FRANCISCO

Dr. Karl M. Bowman, professor of psychiatry in the University of California Medical School, has been appointed to the committee on neuropsychiatry, division of medical sciences, of the National Research Council. Dr. Bowman, past president of the American Psychiatric Association, is director of the Langley Porter Clinic on the San Francisco campus of the University.

Dr. Norman Reider has been appointed chief of the Psychiatric Clinic at Mount Zion Hospital in San Francisco. Dr. Reider succeeds the late Dr. J. S. Kasamin who organized the clinic in 1939. He was recently released by the Army Medical Corps, in which he served as chief of the Neuropsychiatry Section at Halloran General Hospital, New York, and later as chief of medical service. A graduate of Western Reserve University, where he took his degree in medicine in 1932, Dr. Reider has served as resident neurologist at Mt. Sinai Hospital, New York, resident in neuropsychiatry at the Menninger Clinic, Topeka, Kansas, and as director of the Topeka Municipal Neuropsychiatry Clinic. He was in private practice in Los Angeles before entering the Army.

Cited for "distinguished services rendered to Belgium and unusual resourcefulness as an administrator of public health," Dr. J. C. Geiger, San Francisco director of public health, in November was awarded the Officer's Cross of the Royal Order of Leopold the Second, which was conferred upon him by the Prince Regent of Belgium through the Belgian ambassador to the United States.

Dr. Sterling Bunnell, San Francisco surgeon, last month was awarded the Army's highest civilian award, the Medal of Merit, for outstanding war work in reconstructive surgery.

SAN MATEO

One of the first cancer consultation clinics in California is now open at Mills Hospital, San Mateo. The clinic, sponsored by the San Mateo County Medical Association, will be financially supported by subsidies granted by the American Cancer Society from its cancer campaign fund. Establishment of the clinic is part of a state-wide program of the American Cancer Society in organizing tumor clinics for consultation purposes in California's private hospitals.

SANTA CLARA

Reappointment of Dr. Charles L. Ianne as director of the tuberculosis sanitarium at the county hospital was made by the Santa Clara County Board of Su-

pervisors. Dr. Ianne resigned from the position in 1943, after serving 13 years, to accept an appointment in the department of hygiene at Stanford University. He was reappointed to fill the vacancy created by the resignation of Dr. Gerald C. Scarborough, who will enter private practice.

YOLO

Dr. J. L. Porter, who retired from the Yolo General Hospital December 31, will be succeeded by Dr. F. J. Peters, a former United States medical officer and Dr. Porter's assistant.

GENERAL NEWS

Dr. Edward S. Rogers, assistant commissioner for medical administration of the New York State Department of Health, has been appointed dean of the University of California School of Public Health.

California State Health Director Dr. Wilton L. Halverson, has announced the formation of a **Bureau of Chronic Diseases** to coordinate the medical battle against cancer, heart trouble, diabetes and other such ailments. The bureau's aim is to see that available means of treating these diseases are used to their fullest extent. The first job of the bureau, Dr. Halverson said, will be to inaugurate a program for cancer consisting of a survey by counties of available facilities for diagnosing and treating cancer; the setting up of a cancer statistics service for hospitals and clinics, and the establishment of programs of special training for physicians, nurses and other public health workers concerned with cancer. The bureau will be directed by Dr. Lester Breslow.

Two Californians have received appointments to the staff of the **Associated Medical Care Plans**, a national coordinating agency sponsored by the American Medical Association with Chicago headquarters. Frank E. Smith, Los Angeles professional relations director for California Physicians' Service in Southern California, has been appointed director of the A.M.C.P., and William M. Bowman, executive director of C.P.S., will serve as vice-president of a 12-man committee for the organization.

Colonel Bert S. Thomas of Sacramento, former medical director for Selective Service in California, has been appointed medical director for the **State Department of Employment**, it was recently announced by James G. Bryant, chairman of the California Employment Stabilization Commission. Colonel Thomas, who has been a practicing physician and surgeon in Sacramento since 1920, will supervise the medical phases of the administration of the new **disability insurance program** which becomes operative December 1. He will have headquarters in Sacramento.

The American Urological Association is offering an annual award not to exceed \$500 for an essay (or essays) on the result of some clinical or laboratory research in Urology. Competition shall be limited to urologists who have been in such specific practice for not more than five years and to residents in urology in recognized hospitals. **Full particulars** may be had from the Secretary, Dr. Thomas D. Moore, 899 Madison Avenue, Memphis, Tennessee. Essays must be in his hands before May 1, 1947. The selected essay will appear on the program of the meeting of the

American Urological Association, to be held at the Hotel Statler, Buffalo, New York, June 30-July 3, 1947.

Urgent appeal for medical personnel for overseas service is voiced by the Christian Medical Council for Overseas Work. There is need, the Council says, for surgeons and physicians for general hospitals and for specialists in various branches for teaching centers in every quarter of the globe.

"Applicants," the Council says, "should be members of one of the regular Protestant denominational churches and imbued with a spirit of Christian service. **The average pay** is approximately \$80 a month for a single person, double for married couples; which, together with certain allowances (children's, etc.) and the provision of living quarters, permits of a fairly high level of living in the country to which the missionary is appointed."

Communications should be addressed to the Secretary, Christian Medical Council for Overseas Work, 156 Fifth Avenue, New York 10, N. Y.

A constitution was adopted, officers were elected and a scientific program conducted at the organization meeting of the **Western Society for Clinical Research** which was held November 1 and 2 in San Francisco. President of the new Society is **Garth Carpenter**, Los Angeles; vice-president, Mayo Soley, San Francisco; secretary-treasurer, Helen Martin, Los Angeles. Councilors are: Lowell Rantz, San Francisco; Hans Hecht, Salt Lake City; Myron Printzmetal, Los Angeles; Charles McLellan, Salt Lake City; Daniel Green, Seattle; Paul Aggeler, San Francisco.

A public education campaign designed to reduce further the rate of mortality and disability from heart disease is being conducted by Metropolitan Life Insurance Company. Aim is to teach the public what is known about **prevention, early recognition, and care** of cardiac lesions, so that there may be early diagnosis and immediate initiation of treatment. The company says that as a part of the campaign its field representatives, in cooperation with official and voluntary agencies, will reach the homes of millions of policyholders with a recently published pamphlet, "Your Heart," developed in cooperation with the American Heart Association. A lay educational film on heart disease is also being prepared. A packet including material of special interest to doctors will be distributed to physicians, and a scientific exhibit on heart disease, first shown at the A.M.A. meeting in San Francisco, is being made available for state and local professional meetings.

Twelve California physicians are among an additional 122 recently appointed civilian consultants to the Secretary of War through the Surgeon General. **Names of the Californians appointed** and the fields in which they specialize follow: Internal medicine—Dr. John W. Brown and Dr. Dwight L. Wilbur, both of San Francisco; Dr. Verne R. Mason, Los Angeles. Dermatology and Syphilology—Dr. George V. Kulchar, San Francisco. Dermatology—Dr. Edward A. Levin, San Francisco. Aural Rehabilitation—Dr. Grant Fairbanks, Department of Speech, University of Southern California, Los Angeles. Neurosurgery—Dr. Frank W. Lusignan, San Francisco. Urology—Dr. Burton L. Stewart, North Hollywood; Dr. Wil-

liam A. Sumner, San Francisco. Neuropsychiatry—Dr. George S. Johnson, San Francisco. Preventive Medicine and Epidemic Disease—Dr. William McD. Hammon, and Dr. Karl F. Meyer, both of University of California Medical Center, San Francisco.

A program of **postgraduate instruction** through a variety of courses in Internal Medicine, General Surgery, Obstetrics and Gynecology, Otorhinolaryngology, Ophthalmology, Psychiatry and Basic Sciences, as well as a course specially designed to meet the needs of general practitioners, will be announced soon by the **University of California Medical School**. The program has been arranged with the cooperation of University Extension, University of California. Announcements will be mailed to all California

physicians and to a large group in neighboring states. Fees for all courses will be covered by the G.I. Bill of Rights.

Two grants-in-aid for the support of **cancer research projects** at the University of Southern California have been recommended to the United States Public Health Service by the National Advisory Cancer Council. One of the recommendations was for \$5,985 to finance research in the chemical characterization of split protein products from the blood of cancer patients, under the direction of **Dr. Richard J. Winzler**. The other, \$3,002, was for electrophoresis studies of blood and urine proteose and plasma and urinary protein in myelomas, under the direction of **Dr. John W. Mohl**.

INFORMATION

Trend Toward Voluntary Health Insurance

Newly published findings of the Assembly Health Care Investigating Committee, that Californians favor voluntary pre-paid health insurance over compulsory health insurance by a ratio of over $3\frac{1}{2}$ to 1, amount to confirmation of a diagnosis made by the medical profession.

As late as two years ago, a prior State-wide survey of public opinion showed an almost even division on the matter—nearly 50 per cent approving compulsory health insurance. Of these, however, some 20 per cent said they would prefer the voluntary type of protection if it were available. That was significant! Sound voluntary health insurance plans were many and widespread—hospital plans, protection offered by health and accident insurance companies, the medical profession's California Physicians' Service, etc. Apparently a great many people wanted such services but were unaware of their existence or ready availability.

Banking on the diagnosis that lack of factual information, rather than public confidence in the theory of socialized medical service, was reflected in survey statistics, the medical profession undertook an educational campaign on an intensive, community-by-community basis.

Through newspapers, radio and other media of public information, California's doctors set forth, side by side, the records of State medicine as compiled in nations where it has been imposed by law upon the profession and the public, and the records of voluntary health insurance services in America. They proved that there is nothing the State can do for people in this field that they cannot do for themselves far better and at far less cost.

And now, two years later, a survey blanketing California shows 76 per cent of the population favors voluntary membership in health insurance programs, while the percentage favoring compulsory health insurance has dwindled to less than 22 per cent.

The doctors' diagnosis stands confirmed!

LABELING OF BARBITURATES

Anticipating unfavorable reactions on the part of both patients and physicians to the labeling of barbiturate prescriptions to comply with government regulations, some pharmacists are tempering the abruptness of the required warning by adding to the label a statement calculated to preserve the relationship of physician to patient.

A Food and Drug Administration regulation requires that refillable barbiturate prescriptions be labeled as habit forming and also with the barbiturate content per unit. To this information, some pharmacists are adding the statement: "Medicine of this type should be taken only for the purpose and for the length of time which your physician prescribed it."

At the time the warning label was ordered by the Food and Drug Administration, pharmacists opposed it on the ground that it might be interpreted by the patient as a reflection on the physician's competence to prescribe the drug. This position was supported by the California Medical Association in a resolution passed by the House of Delegates at its meeting last May.



Letters to the Editor . . .

SURFACE PHAGOCYTOSIS

A hitherto unsuspected mechanism of phagocytic activity of major clinical interest is described by Wood³ and his associates of Washington University School of Medicine, St. Louis, Missouri.

Phagocytes were obtained from peritoneal exudates of rats injected 24 hours previously with an aleuronat broth mixture. Approximately 90 per cent of the cells thus obtained were polymorphonuclear leucocytes and 10 per cent macrophages. Suspensions of thrice-washed phagocytes in gelatin-Locke's solution were mixed with washed type I pneumococci. No phagocytosis took place in this mixture when incubated in rotating glass tubes, as hanging drop preparations, or when spread on the surfaces of glass, paraffin, albumin or cellophane. This is in line with conventional theory which assumes that phagocytosis of encapsulated pneumococci is impossible except in the presence of type-specific opsonins.²

In contrast with these negative findings, highly active phagocytosis took place when the same mixture was brought into contact with filter paper, lens paper, cloth or fibreglas. From these observations it was concluded that both polymorphonuclear leucocytes and macrophages, when given access to a suitable surface, will phagocytize virulent pneumococci without the aid of an intermediary antibody or any other tissue factor. The St. Louis investigations suggest the use of the term "surface phagocytosis" for this new phenomenon, but without suggesting a definite theory as to the physical, chemical or biological factors involved.

In order to test possible clinical applications of this new phenomenon, small pieces of selected tissues taken from freshly killed rats were placed in the bottom of Petri dishes lined with moistened filter paper. A small drop of leucocyte-pneumococcus mixture was spread over each tissue surface. Each Petri dish was then sealed with Scotch tape, and incubated for one hour. Impression smears from the tissue surfaces demonstrated highly active phagocytosis on each tissue surface. Among the tissues tested were bronchial and tracheal epithelium, esophageal epithelium, the intima of both aorta and vena cava, pleura, pericardium, endocardium, peritoneum, mesentery, retina, muscle, and clotted plasma. When the same tissues had been previously boiled for 30 minutes the same phagocytic action took place.

The phagocyte-pneumococcus mixtures were then injected intrabronchially into (a) the lungs of normal rats, (b) the lungs removed from rats and perfused with gelatin-Locke's solution, and (c) rat lungs fixed for 24 hours in 10 per cent formalin and then washed for several days to remove the fixative. Each experiment was carried out at body temperatures. Sections cut from each type of preparation showed that both polymorphonuclear leucocytes and macrophages phagocytized pneumococcus in the alveoli within less than an hour. In the formalin-fixed lungs there was no possible source of opsonin.

Examination of the formalin-fixed lungs revealed that pneumococci were engulfed by the phagocytic cells in the larger bronchi as well as by those in the alveoli. Phagocytosis failed to occur, however, when the same leucocyte-pneumococcus mixtures were tested in capillary glass tubes of the same diameter as the bronchi. This suggests that the crucial factor in the phagocytic process is related in some way to the character of the bronchial surface, justifying the suggested terminology "surface phagocytosis."

Wood finds clinical confirmation of his findings in the abundant phagocytosis that takes place in the early stages of lobar pneumonia, before the appearance of specific antibodies.¹

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2. Robertson, O. H., and VanSant, H.: *J. Immunol.*, 37:571, 1939.

3. Wood, W. B., Jr., Smith, M. R., and Watson, B.: *Science*, 104:28 (July 12), 1946.

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ISOLATION OF Rh-HAPTEN

In 1944 it was shown by Belkin and Wiener¹ of the Jewish Hospital, Brooklyn, N. Y., that Rh-antigen is present quantitatively in the stromata of Rh-positive human red blood cells. They found that such stromata could be injected intramuscularly into human volunteers, without demonstrable toxic reactions. From this they suggested the clinical use of such stromata in attempted desensitization of Rh-negative mothers while carrying a Rh-positive fetus. The possibility of a successful application of this technique is increased by the isolation and purification of the Rh-antigen and hapten from such stromata, currently reported by Calvin² and his associates of the Department of Chemistry, University of California and the Department of Medicine, Stanford University.

Rh-positive erythrocytes centrifuged from citrated human blood were laked at 5°C by the addition of eight to ten volumes of distilled water. The stroma thus obtained was repeatedly washed by super-centrifugation and dried by lyophilization. Approximate yield 1-2 g. per 250 cc. r.b.c. The dry product thus obtained dissolved at pH 7-8 yielded a solution which completely inhibited Rh-agglutination by anti-Rh serum when tested in relatively high dilutions. Control tests with Rh-negative stromata gave negative results.

By a modification of the Jorpes³ technique, this Rh-positive stroma was separated into two fractions. About 60 per cent of the stroma complex was precipitated by ultracentrifugation at pH 5.5 to 6.0. This "stromatin" fraction contained no demonstrable Rh-antigen. By changing the pH titer to 7-8 a second ultracentrifugable fraction was obtained. For this the California investigators propose the term "elinin." Elinin is a lipoprotein, and contains the Rh-antigen quantitatively.

Adopting a modification of the Landsteiner⁴ technique a lipoidal fraction was extracted from elinin by the use of 3:1 alcohol-ether. This lipid constitutes from 40 to 50 per cent of the elinin complex, and apparently contains the Rh-hapten quantitatively. If this lipid has immunological properties similar to those of other known haptens, one would expect it to serve as an effective prophylactic and desensitizing agent in the prevention or treatment of erythroblastosis fetalis⁵ and related toxemias. Clinical trials, however, have not yet been reported.

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1. Belkin, R. B., and Wiener, A. S.: *Proc. Soc. Exp. Biol. and Med.*, 56:214, 1944.

2. Calvin, M., Evans, R. S., Behrendt, V., and Calvin, G.: *Proc. Soc. Exp. Biol. and Med.*, 61:416 (April), 1946.

3. Jorpes, E.: *Biochem. J.*, 26:1488, 1932.

4. Landsteiner, K.: *The Newer Knowledge of Bacteriology and Immunology*, University of Chicago Press, p. 892, 1928.

5. Editorial, "Prevention of Erythroblastosis fetalis," *J.A.M.A.*, 131:525 (June 6), 1946.

BOOK REVIEWS

IT'S AN ALLERGY. By Frank G. Crandall, Jr., M.D. Murray and Gee Inc., Hollywood, California, 1946, pp. 313. Price \$3.50.

Recent survey indicates that about 10 per cent of the total population of the United States or about 14 000 000 people, have some major allergic condition such as hay fever, asthma, hives or eczema. It is not surprising, therefore, that the layman has become allergy conscious and has sought some simple explanation of the probable cause of his ailment and how to obtain worthwhile relief. Until recent years, however, this information was available for the most part in articles published in lay periodicals and in the health columns in our newspapers. Whereas such articles are informative, they do not always have the authoritative stamp of the physician devoting much of his time to allergic diseases.

Dr. Crandall's authoritative book written for the layman and the allergic patient presents the subject in a clear and simple style. The subject matter is divided logically into separate chapters devoted to such common allergic manifestations as Asthma, Hay Fever, Food Allergy, Hives and Eczema. In addition there are chapters on the Frequency, Diagnosis and Treatment of Allergy. The language is clear and simple and should be easily understood by the layman. The fact that the author brings to his special work in Allergy a large clinical experience obtained in general practice adds great value to the advice which he gives the allergic patient as to the manner of living, eating and working so as to obtain as much relief as one may expect in an ailment in which heredity plays so important a part.

In recent years other books on allergy have been written for the layman but none has accomplished so well Dr. Crandall's aim, namely to acquaint the allergic patient with the underlying cause of his ailment and how to combat it.

It should be stressed further that the practitioner who has not followed the recent developments in our knowledge of allergic diseases may profit by reading Dr. Crandall's book.

HEALTH EXAMINATIONS. A Manual for the General Practitioner. Prepared for The Medical Society of the County of New York by the Special Committee on Preventive Medicine. 1946. Mead Johnson & Company. Pp. 144.

The early recognition and care of abnormal states in the individual have become an important part of the duties of the general practitioner and his diagnostic partners, the internist and the pediatrician. The stated object of this manual is to make available for convenient use of the physician the content and method of examinations of various types of patients, according to age or the reason for which they may seek examination.

Some of the suggested examinations are more suitable for the specialist than the general practitioner (such as Eye and Ear); other sections are colored by the opinions of the author (Body Build and Endocrine Imbalance). There are a few contradictions arising from differences in viewpoint of two authors (on page 38, thumb sucking is stated to have no deleterious effect on dentition; on page 138, it is said to be productive often of malocclusion of the teeth or facial deformities).

On the whole, it is well done as a quick review and reference book for the practitioner who may wish to become conversant with the reasons for and the techniques of the examination of the presumed healthy person. The chapters on emotional factors are especially recommended.

RENAL HYPERTENSION. By Eduardo Braun-Menéndez, Juan Carlos Fasciolo, Luis F. Leloir, Juan M. Muñoz, and Alberto C. Taquini, Institute of Physiology, Faculty of Medical Sciences and Institute of Cardiology, V. F. Greg Foundation, Buenos Aires, Argentina. Translated by Lewis Dexter, M.D., Harvard Medical School and Peter Bent Brigham Hospital, Boston, Massachusetts. Pp. 451. 93 illustrations. First edition. Charles C. Thomas, Springfield, Illinois, 1946. Price \$6.75.

The velocity of new work in the field of renal hypertension has slowed considerably in the past few years in comparison to the enormous productivity following Goldblatt's classic paper in 1934. The lull in the investigative developments has been wisely used by the authors to present the most complete, critical, and authoritative review of the subject of renal hypertension available in the literature. The translation by Dr. Dexter, with the addition of work done since the original Spanish edition was written, is clear and the style is easily followed.

Several features of the book are outstanding. The most important is the really critical evaluation of the vast literature that is reviewed and the authors are particularly well qualified by their own important contributions and experience to do this. Many books faithfully catalogue and compile papers relating to the subject, but few analyze the work done with a critical eye toward accurateness of method, meticulousness of detail, validity of the conclusions as based on the facts, and correlation with previous and subsequent work insofar as consistencies are concerned. The authors are direct and blunt at times in pointing out uncritical work or commenting on conclusions not adequately demonstrated by the data presented. It is felt that this is most valuable.

Another feature of the book that is outstanding is the incorporation of 93 figures that illustrate significant work described in the text. These figures relate not only to the original work of the authors, but to significant work elsewhere, and allow the reader to evaluate for himself the data presented. The extensive bibliography of 1,238 references will be invaluable in reviewing specific phases of renal hypertension and it reflects the tremendous output of work done in the field, since most of the papers were published in the last ten years.

The appendix summarizing the author's methods of preparation and assay of renin, hypertensinogen, hypertension, and hypertensinase will prove of value to those working in the field.

The sections of the book dealing with essential human hypertension are not as complete as those dealing with experimental hypertension. One might also object to the relatively abrupt manner in which the authors discuss the important work of Castleman and Smithwick on renal biopsies performed on hypertensive patients during sympathectomy. The authors indicate that the biopsy findings do not necessarily reflect the arteriolar changes in the kidney as a whole. It is of interest that the authors believe essential hypertension in man is primarily renal in origin.

This book can be highly recommended to all physicians.

EARLY AMBULATION AND RELATED PROCEDURES IN SURGICAL MANAGEMENT. By Daniel J. Leithauer, M.D., F.A.C.S., Chief of Surgery, St. Joseph's Mercy Hospital, Detroit, 1946. 36 Figures. 6 Tables. 260 References. Charles C. Thomas, Publisher, Springfield, Illinois. Price \$4.50.

This book presents the ease for early ambulation in a very convincing manner. The history of ambulation is treated in outline form, impressing readers with the number of early writers who recommended it. General

physiologic principles involved are freely discussed. A chapter on postoperative pulmonary complications cites experimental work by Churchill, Hilding, Beecher and others, in support of early postoperative activity. Circulatory, wound, and gastrointestinal complications are treated in short, separate sections, each with an ample bibliography. The chapter on surgical technique contains a number of commendable suggestions, although the author's enthusiasm for catgut is not shared by many surgeons. Stress is laid on muscle splitting and transverse incisions, which are justifiably recommended.

PROBLEMS IN ABNORMAL BEHAVIOUR. By Nathaniel Thornton. The Blakiston Company, Philadelphia, 1946. Price \$2.00.

This book, apparently directed to the layman, covers a most extensive field, from psychoanalysis to endocrinology. In spite of the necessarily superficial approach, it is not without some merit. Quite possibly the physician unfamiliar with present day thought in the field of human behavior might profit from its perusal, on the assumption that he would possess sufficient critical faculties to discern the not infrequent errors, which may best be illustrated by the following example. On page 217, speaking of epilepsy, it is stated, "If there be any evidence of its resting on an organic foundation (for example, brain tumor or general paresis), then we speak of idiopathic epilepsy. Where no organic basis is discoverable, we speak of symptomatic epilepsy." The book is certainly not one to recommend to patients, particularly those suffering from nervous disease. For the public at large, although it might be capable of satisfying a certain morbid curiosity regarding mental disease, it would contribute little to a sympathetic understanding of the subject.

ACIDOSIS. CLINICAL ASPECTS AND TREATMENT WITH ISOTONIC SODIUM BICARBONATE SOLUTION. By Esben Kirk, M.D., Chief Physician, Medical Service, Holstebro District Hospital, Holstebro, Denmark. Copyright by Einar Munksgaard. Translated by Miss Annie I. Fausboll, M.A., and the Author. Einar Munksgaard, Publisher, Copenhagen, 1946. Price: dan. cr. 18.—.

"The object of the present book is to spread the knowledge of acidosis and of the treatment of this often dangerous complication with isotonic sodium bicarbonate solution, a therapy which the author had the pleasure of introducing into Denmark in 1934." This statement from the preface fairly sums up the contents of the book, written by a former student of Van Slyke. Clinical forms of acidosis are tabulated and then illustrated by 54 rather generous case reports. A chapter is given to the analytical technique for the determination of the bicarbonate content of the plasma.

The author points out that it was another Dane, S. P. L. Sorensen, at whose suggestion the sign pH was adopted as an expression of the hydrogen ion concentration. The latter is ignored, except for a foot-note, by the definition of "acidosis in a clinical sense . . . as a condition in which the bicarbonate content of the plasma is reduced." Thus the respiratory alkalosis following salicylates arbitrarily becomes a state of acidosis.

There is an interesting account of the earliest use of injections of alkaline solutions, against the cholera in the English epidemic of 1831-32. Otherwise, from an academic viewpoint, there should be little need for such a book in this country.

On the other hand, the author makes a strong case for the intravenous administration of isotonic (1.3 per cent) sodium bicarbonate solution in the therapy of acidosis. Certainly this is more direct and may at times be more beneficial than the current use of sodium lactate for the same purpose. Unfortunately, the former solution is not generally available commercially.

THE PRINCIPLES OF NEUROLOGICAL SURGERY. By Loyal Davis, M.S., M.D., Ph.D., D.Sc. (Hon.). Third Edition, Thoroughly Revised. With 193 Engravings, Containing 348 Illustrations and 5 Plates, 4 in Color. Lea & Febiger, Philadelphia, 1946. Price \$7.50.

A concise and well written reference book of conditions amenable to neurosurgical treatment. The author has been successful in affording a source of practical information for the benefit of those physicians, not specializing in neurology, who are interested in the proper selection of patients for surgical treatment. The rationale and results of operation are emphasized rather than the technical details of the procedure.

The chapter on oraniocerebral injuries should prove a valuable aid in the conservative management of patients with acute head injuries.

Attention is given to the problem of pain. An adequate discussion is included of the accepted surgical procedures employed, and the limitations of each method.

The chapter on the Sympathetic Nervous System is very complete, particularly from the historic aspect. However, the clinical portion of the discussion is not adequate with regard to the surgical treatment of essential hypertension. The newer thoracolumbar type of sympathectomy, which has proven more successful than previous methods, warrants more discussion. Undue emphasis is placed on thiocyanate therapy.

Neurosurgical conditions are encountered with increasing frequency in general practice as well as in many specialties, and this volume should prove invaluable in the diagnosis and proper disposition of patients with such conditions.



MEDICAL JURISPRUDENCE

HOSPITALS: NEGLIGENT CARE OF PATIENT FOLLOWING AN OPERATION; FAILURE TO DISCOVER PRESENCE OR PREVENT DEVELOPMENT OF TETANUS

HARTLEY F. PEART, Esq., *San Francisco*

In *Valentin vs. La Societe Francaise De Bienfaisance Mutuelle De Los Angeles*, 76 A.C.A. 1, (September 6, 1946) an action was brought by the plaintiff for the wrongful death of his son. The facts giving rise to the suit for negligence were as follows:

Plaintiff's son, who was 20 years of age, entered the defendant's privately owned hospital for a hernia operation. Following the successful operation on August 19, 1940, the patient's condition was normal until August 27, 1940, when a pleuritic pain in his right side, with a temperature of 101, was diagnosed as broncho-pneumonia. On the 28th and 29th, his fever registered 102.6 degrees and he was flushed and dyspnoic. On the 31st, the patient's temperature showed a decline but he complained of soreness in his chest and of his inability to chew. At noon of that day, on request of the bedside nurse that he be examined, Dr. H, the resident physician, found the patient suffering a tight feeling in his throat and pain on attempting to open his mouth. Dr. H reported to the supervisor of nurses that it looked to him "like this might be a case of tetanus" and instructed her to call the attending physician. Dr. H then left for the day. Dr. X, the attending physician, did not arrive until 11 P.M.

The nurse's chart for August 31 showed a progressive deterioration, pain and stiffness in the neck, tightness in the chest, difficulty in opening the mouth and in swallowing, poor appetite, much expectoration, drowsiness.

At 7:30 P.M. of August 31, the patient's mother arrived and was alarmed to find the marked change for the worse in her son. She reported her observations to the head nurse, expressed her extreme anxiety and demanded that some physician be called at once. Thereafter for three hours she continued her remonstrances in vain. She reminded the night supervisor of nurses that there were many doctors and insisted that one be called. Just after her departure at 10:30 P.M., Dr. B, on leaving a patient upon whom he had called, at the request of the night supervisor examined the patient and announced him to be suffering from tetanus and advised that he be at once transferred to the county hospital. After his arrival there at 1:50 o'clock in the morning, antitetanic treatments were vainly administered throughout the day. The patient died at 9:10 P.M.

At the conclusion of the jury trial, the defendant hospital's motion for an instructed verdict was denied. A verdict was returned in favor of the plaintiff and there-

after, the defendant's motion for a judgment notwithstanding the verdict was granted on the ground that there was no evidence proving or tending to prove negligence proximately causing the death. Following a denial of plaintiff's motion for a new trial, plaintiff appealed. The question presented to the District Court of Appeal for decision was whether the court committed a prejudicial error in granting defendant's motion.

In reversing the judgment of the trial court and instructing the lower court to enter a judgment in favor of plaintiff, the California District Court of Appeal stated that a private hospital is bound to furnish a patient with the services of competent, learned, skillful physicians and surgeons and with the care of trained nurses. The court continued to say that "it is the duty of any hospital that undertakes the treatment of an ill or wounded person to use reasonable care and diligence not only in operating upon and treating but also in safeguarding him, and such care and diligence is measured by the capacity of the patient to care for himself."

In analyzing the facts of this case, the court felt that in the treatment and nursing of the patient by the defendant, there was evidence that the servants of the defendant were negligent in that they failed to exercise ordinary care in the application of the skill, learning and diligence reasonably required in a private hospital in Los Angeles in 1940 and in refusing to take steps for the protection of the patient or to act when evidence of the presence of a pathological condition and of a progressive deterioration was brought to their attention. The court again stated that "a private hospital is required to give its patients the character of treatment customarily administered for the same disease or symptoms by similar hospitals in the same locality and at the time in question. It must exercise such reasonable care in treating a patient as his known condition may require."

In reading the evidence, the court found that had the defendant caused an examination by a physician on the 30th at 5 P.M. when the patient displayed the first symptoms of tetanus, the virus would then have been found and the patient might have had 49 hours of antitetanic treatments before 9 P.M. of the day he died instead of only 19 hours.

From this evidence, the California District Court of Appeal came to the conclusion that the jury had sufficient evidence from which it could determine that the delay in causing the appropriate medical treatment to be given the patient was the proximate cause of his death.





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BOARD OF MEDICAL EXAMINERS OF THE STATE OF CALIFORNIA

By FREDERICK N. SCATENA, M.D.

Secretary-Treasurer

Board Proceedings

A regular meeting of the Board of Medical Examiners was held at 1020 N Street, Sacramento, October 21 to 24, 1946.

The following changes were made in the status of licentiates after a regular hearing:

Rodney Madison, Drugless Practitioner. License suspended for a period of six months. At the end of the suspension he was to be placed on probation for a period of five years, and to report as specified under the terms of probation.

Francis Manley Stump, M.D. Not guilty as charged in the violation of Section 2377 of the Business and Professions Code. Found guilty as charged in the violation of Section 2392, and he was placed on probation for a period of one year.

Darrington Weaver, M.D. License restored and he was placed on probation for a period of five years with specified terms.

George H. Wyman, M.D. License restored under conditions outlined in the decision of the Board restoring his certificate and placed on probation for a period of five years with specified terms after meeting conditions set forth in decision.

The following dates for Board meetings and oral examinations were set providing suitable accommodations are available:

Meetings and Written Examinations

Los Angeles, March 10 to 13, inc., 1947.

San Francisco, July 7 to 10, inc., 1947.

Los Angeles, August 25 to 28, inc., 1947.

Sacramento, October 20 to 23, inc., 1947.

Oral Examinations

San Francisco, January 11 and 12, 1947.

Los Angeles, March 8 and 9, 1947.

San Francisco, May 10 and 11, 1947.

San Francisco, July 19 and 20, 1947.

Los Angeles, November 8 and 9, 1947.

On July 30, 1946, all hospitals in California were notified that, under the provisions of the Business and Professions Code, a resident at the time he commences his residency must possess a valid unrevoked license to practice in the State of California. The Board is now requesting all hospitals to file a notarized list of all residents employed by the hospital, the date of the commencement of their residency, and the date of their California license.

A Committee of the Board, under the chairmanship of Dr. Anthony B. Diepenbrock of San Francisco, is working on changes in the Business and Professions Code relating to the practice of medicine and surgery in order to bring it up to date with regard to the minimum requirements for Class A medical schools, and to other changes which will clarify other sections of the Code.

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The Section on Pediatrics of the American Medical Association in cooperation with the Bureau of Health Education has produced a series of electrically transcribed 15 minute radio programs entitled "Keeping Your Baby Well." This is the fourteenth series prepared under the direction of this bureau, bringing the total to 180 programs, according to the October 5 issue of *The Journal*.

More than 4,000 local broadcasts on more than 120 radio stations have been made from these transcriptions. Each program is summarized by Dr. W. W. Bauer, Director of the Bureau of Health Education. They are available to any local medical society, health departments or other health agencies. All others wishing to borrow the transcriptions should procure approval from the local medical society. There is no charge connected with the

loan except the expense of express shipment to return the records.

These transcriptions, featuring interviews with 20 pediatricians selected by the officers of the section, include the following topics and speakers:

1. You and Your Baby, C. Anderson Aldrich, Rochester, Minn.
2. The Premature Baby, Julius H. Hess, Heyworth N. Sanford and A. H. Parmalee, Chicago.
3. Keeping Our Babies Well, Borden S. Veeder, St. Louis.
4. Breast Feeding Is Best, W. C. C. Cole, Detroit.
5. Artificial Feeding Can Be Good, Clara M. Davis, Winnetka, Ill., and Henry Gerstenberger, Cleveland.
6. Babies Who Fail to Gain, C. W. Burhans, Cleveland.

(Continued on Page 40)



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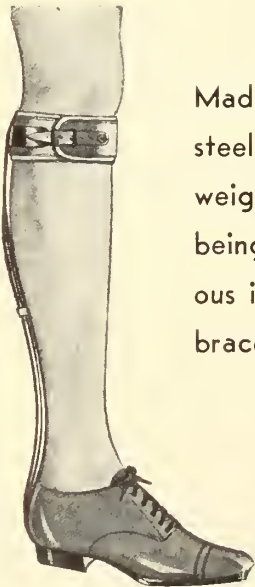
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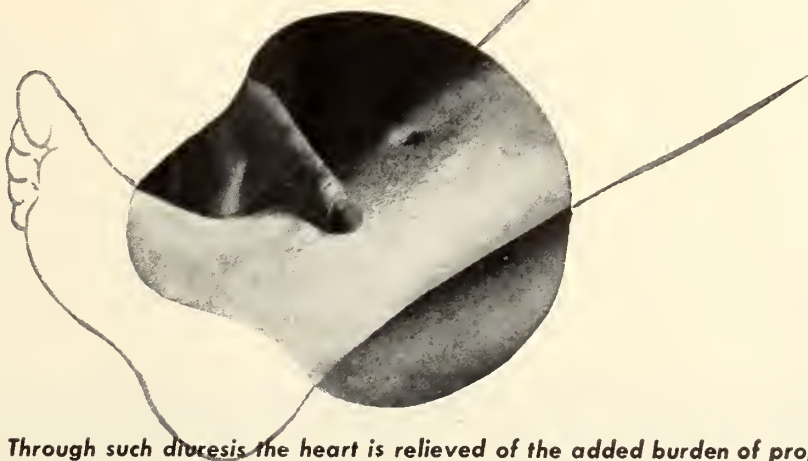
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(Continued from Page 38)

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9. Vitamins, J. A. Bigler, Highland Park, Ill.
10. Allergy, Ben Z. Rappaport, Chicago.
11. Care of the Baby's Skin, W. L. Crawford, Rockford, Ill., and Abraham B. Schwartz, Milwaukee.
12. Tonsils In or Out, Stanley Gibson and George S. Livingston, Chicago.
13. Child Poisonings, John Aikman, Rochester, N. Y.

STUDY SHOWS HOW STREPTOMYCIN FIGHTS DISEASE GERMS IN BODY

In the most comprehensive report issued since streptomycin was first described in 1944, the September 7 issue of *The Journal of the American Medical Association* reviews the results obtained in the treatment of 1,000 cases of various infections with this gallant new antibiotic drug which is derived from a soil microbe.

The report based on a study carried out by 55 investigators, was prepared by the Committee on Chemotherapeutic and Other Agents of the National Research Council, composed of Drs. Chester S. Keefer, of Boston, chairman; Francis G. Blake and John S. Lockwood, both of New Haven, Conn.; Perrin H. Long and E. K. Marshall, Jr., both of Baltimore, and W. Barry Wood, Jr., of St. Louis.

(Continued on Page 42)

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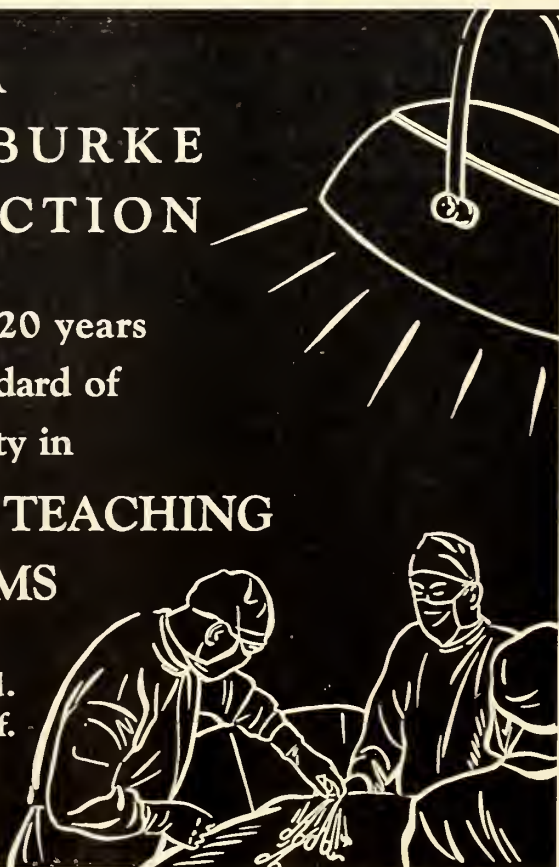
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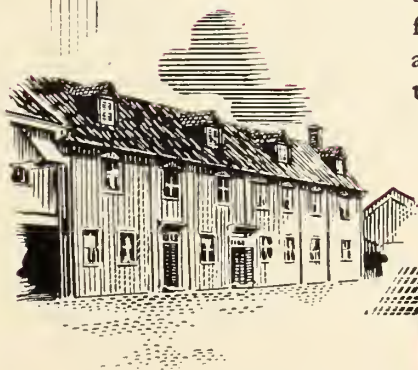
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STUDY SHOWS HOW STREPTOMYCIN FIGHTS DISEASE GERMS IN BODY

(Continued from Page 40)

The committee's report was released shortly after the Civilian Production Administration announced that designated hospitals would begin limited commercial distribution of streptomycin. More than 1,600 general hospitals have been selected as depots for the drug, and they now are supplying other hospitals in their respective areas. Heretofore streptomycin was available only in small amounts and this was distributed by the Civilian Production Administration to the Army, the Navy, United States Public Health Service, Veterans' Administration and the National Research Council for integrated clinical research.

Million Dollars to Finance Program

Producers of streptomycin contributed nearly a million dollars to finance the committee's program.

The drug was discovered by Dr. Selman A. Waksman at the New Jersey Agricultural Experiment Station, Rutgers University, New Brunswick. Waksman and a young assistant, Dr. Albert Schatz, came upon their discovery while working with a soil microbe called *Actinomyces griseus*. They had found two specimens of this creature; one from a piece of highly manured soil on the college farm, the other in a swab taken from the throat of a chicken. This griseus looked like a brilliant performer right from the start. It attacked and killed scores of disease bacteria. Its chemical killing stuff was extracted and named streptomycin. Since that time the drug has been used experimentally in scores of laboratories and clinics throughout the country and now medical science is able to evaluate the results of its use against many diseases.

From time to time, the new drug has been acclaimed as effective against tuberculosis. Touching on this phase

(Continued on Page 46)

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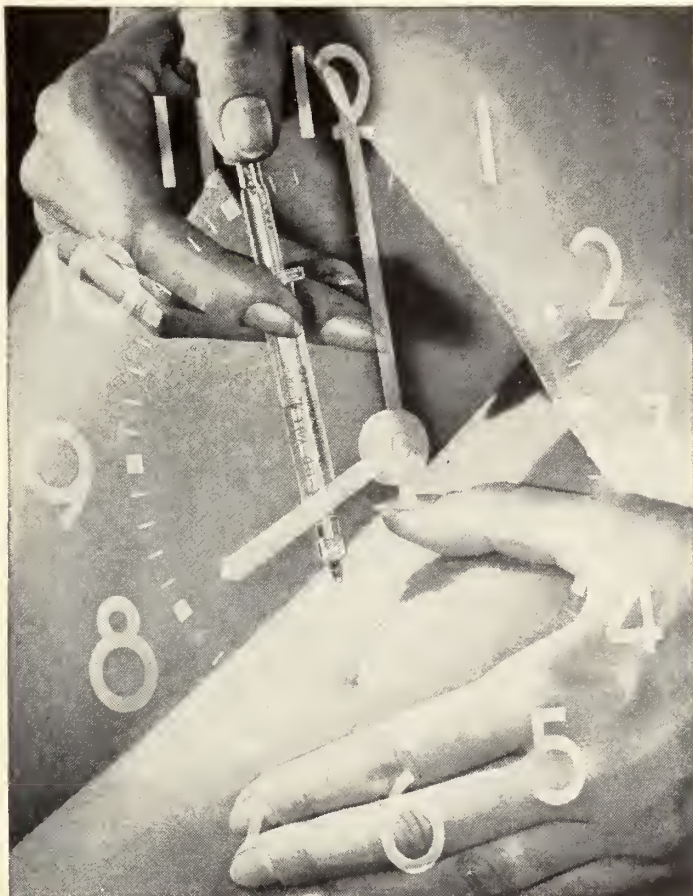
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References: 1. Dodd, K. and Minot, A.S.: *J. Pediat.*, 8:442, 1936.
2. Dodd, K. and Minot, A.S.: *J. Pediat.*, 8:452, 1936.
3. Sahyun, M.: *Am. J. Dig. Dis.*, 13:59, 1946.

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STUDY SHOWS HOW STREPTOMYCIN FIGHTS DISEASE GERMS IN BODY

(Continued from Page 42)

of research, the committee's report says:

"When the program of the committee was started on March 1, 1946, it was impossible for us to develop a wide study of tuberculosis. Only the cases that were already under investigation prior to March 1 were continued in order to complete this human experiment. This policy was necessitated by the small supplies of streptomycin available and the magnitude and long-range nature of the problem. It is the hope of the committee that adequate ways and means may be found for studying the application of streptomycin to tuberculosis so that its place in the treatment of this disease can be defined."

One section of the report deals with the experimental studies of streptomycin in tuberculosis which were carried out by H. C. Hinshaw, M.D., Ph.D., Division of Medicine, and W. H. Feldman, D.V.M., M.S., Division of Experimental Surgery and Pathology, Mayo Foundation. Their studies demonstrated that "streptomycin has a powerful effect in inhibiting the growth of tubercle

bacilli in experimental tuberculosis of guinea pigs. Many pigs can be saved by treatment and in 30 per cent the organisms cannot be isolated from the organs of the surviving animals."

Dr. Hinshaw studied 75 patients with various forms of tuberculosis over a one and a half year period.

Twenty-four of these patients suffered from pulmonary tuberculosis and all of them were given streptomycin. "In general," the report says, "patients with a grave prognosis were selected for investigation—that is, patients who had not improved on conventional forms of therapy. Patients who had had collapse therapy were excluded from the study."

List Five Patients As Failures

"Five are listed as failures. Two of these are so regarded because they died, although they showed some improvement by x-ray prior to death and were in the terminal stages of their infection prior to treatment. The other three were regarded as failures since they showed no benefit, although they also got no worse. So far Dr. Hinshaw has not observed pulmonary tuberculosis extending into previously uninvolved areas of lung during

(Continued on Page 50)



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STUDY SHOWS HOW STREPTOMYCIN FIGHTS DISEASE GERMS IN BODY

(Continued from Page 46)

streptomycin treatment, in spite of the fact that lesions were extending prior to institution of therapy. He has witnessed recurrence of progression of tuberculosis following the discontinuance of therapy, when beneficial effects had been observed while under treatment. This occurred in four of 19 patients who showed regression of the disease process while under treatment. . . .

"In summing up, Dr. Hinshaw expressed the opinion that, if his work is confirmed, streptomycin is very likely to prove valuable as a palliative remedy in tuberculosis, at least because of its apparent suppressive action. In his experience it did not eradicate infection. Clinically, such a suppressive measure would be of tremendous value as a stopgap measure to be taken prior to or following other forms of treatment, including surgery." In conclusion the report says:

Committee Urges Extensive Study

"Tuberculosis of various organs needs to be studied more extensively with streptomycin. A long-range program should be planned and the patients followed for a minimum period of five years. From the experience which has accumulated so far, it appears that a minimum period of three to six months treatment will be required and in some cases it will be necessary to treat patients for a longer time. Since streptomycin has an inhibitive effect on the growth of the tubercle bacillus, and since the exudative lesions do not progress while the patient is under treatment, this agent should be helpful in tuberculosis when it is combined with other established methods of treating this infection."

The committee says that from the evidence accumulated so far, streptomycin is "the best agent available" for the treatment of tularemia or rabbit fever. This disease is carried by rats, rabbits and 20 other animal species. It strikes 1,000 or more persons, mostly hunters and butchers, in the United States each year. The disease rarely kills over 5 per cent of its victims, but leaves the rest of them debilitated to a point where they may be bedridden for months.

Obtain Best Results in Tularemia

Streptomycin was tried in 67 cases of tularemia, with 63 recoveries. "The results were striking and immediate in 55 and gradual but permanent in eight. Nearly every patient was treated with one gram per day for an average of seven days. The majority of cases had been treated previously with sulfonamides and penicillin."

The committee says that "extremely favorable results have been obtained" in the treatment of Hemophilus influenzae meningitis when injections of streptomycin were started early in the course of the disease. Influenzal meningitis has nothing to do with the disease usually called influenza. Rare in adults, influenzal meningitis is not infrequent in children. About 85 per cent of the cases occur in the age period from two months to three years. Mortality is high.

Streptomycin, the committee adds, should be used in all cases of bacteremia—those diseases caused by bacteria in the blood stream. The drug was used in 91 cases. Forty-nine patients recovered and 12 improved. In four there were no appreciable effects, although the patients survived. Twenty-six patients died. "The evidence is good," the report says, "that the streptomycin exerts a

(Continued on Page 54)

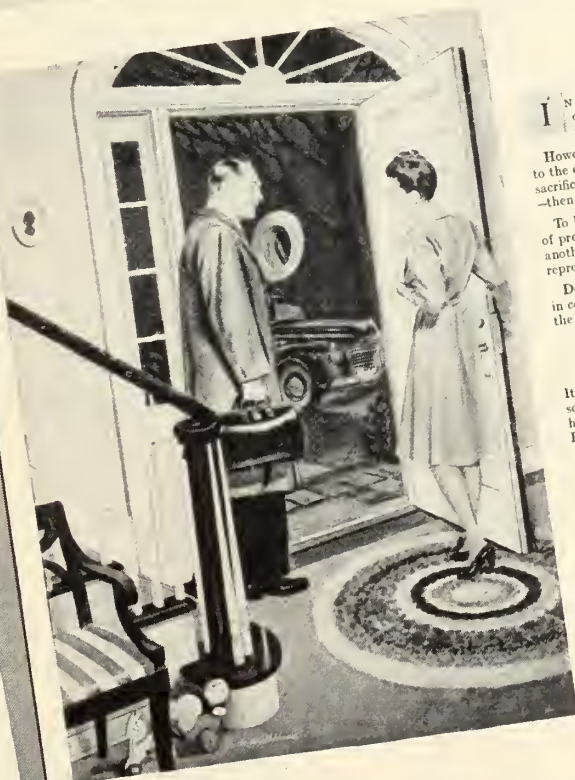
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STUDY SHOWS HOW STREPTOMYCIN FIGHTS DISEASE GERMS IN BODY

(Continued from Page 50)

favorable effect in clearing the blood of organisms and influencing the local infection."

Effective In Urinary Tract Infections

The investigators found that streptomycin is especially effective in urinary tract infections which plague older persons. It sweeps this type of infection away in a few days. The 409 cases of urinary tract infection were caused by a great variety of bacterial species. The overall recovery rate was 42 per cent. A high percentage of the cases were chronic infections of two months to 20 years duration. Of the patients who improved, 19 per cent relapsed after treatment was stopped. Almost all of these

infections had been treated previously with sulfonamides and penicillin.

The results in the treatment of typhoid fever, *Salmonella* infections and brucellosis "have been disappointing in that there is no convincing evidence that the course of the disease in any of these infections is shortened," the committee's report says, adding: "Too few patients with typhoid have been treated to ascertain whether the fatality rate can be reduced, and patients with brucellosis have not been followed long enough to determine whether the relapse rate can be reduced. In any event, no dramatic results have been observed in any of these infections."

Note Minor Toxicity from Drug

The committee also reported on the toxicity of the drug. In the 1,000 cases covered in the survey the overall incidence of untoward side effects was 20.5 per cent.

(Continued on Page 56)



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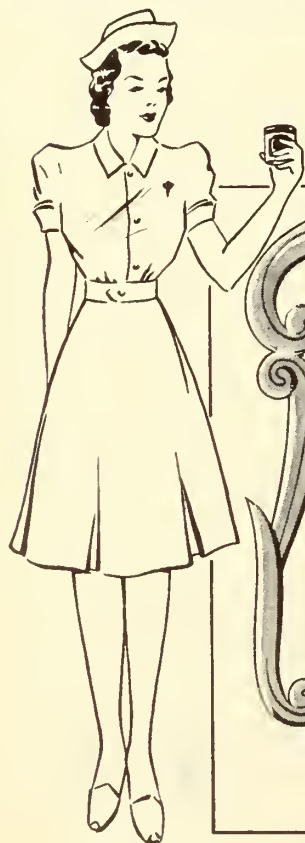
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(Continued from Page 54)

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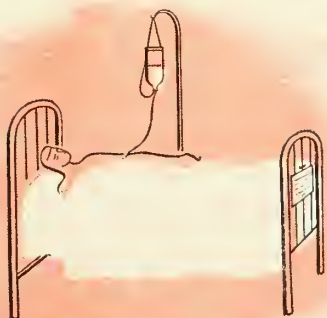
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Lund and Levenson: J.A.M.A. 128:95, 1945

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Editorial: Surg., Gynec. & Obst. 83:259, 1946

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Loop: Geriatrics 1:269, 1946

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RINGWORM OF THE SCALP AFFECTS ABOUT FOUR BOYS TO EVERY GIRL

The ringworm of the scalp epidemic, prevalent in many cities in the United States and Canada, affects approximately four boys to every girl, according to Lee Carrick, M.D., of Detroit, who made a study of 171 cases at the City of Detroit Receiving Hospital.

Writing in the August 10 issue of *The Journal of the American Medical Association*, Dr. Carrick, who is from the Department of Dermatology and Syphilology, Wayne University College of Medicine, states that x-ray removal of the diseased hair by the roots is the treatment of choice but "there are neither the facilities nor enough qualified personnel available for successful execution of such a tremendous task."

Three ointments, one developed from a copper compound and the other two from some fatty acids and their salts, are described by the author as valuable for local treatment in the fight against ringworm of the scalp. However, the author cautions that none of these ointments should be considered a substitute for x-ray removal of the hair.

Between October, 1944, and March, 1946, 171 children ranging from one to 13 years of age were examined. One hundred and sixty-nine of this number (98.8 per cent) had fungi of the human type and two had fungi of the animal type. Of the 171 cases only 32 (18.7 per cent) were in girls as compared to 139 in boys (81.3 per cent), the ratio of boys to girls being 4.3:1.

Examination under the Wood light revealed ringworm of the scalp in these patients. In a darkened room, under this light, normal skin and hair fluoresce faintly, while hairs infected with the fungi show brilliant beads of fluorescence and scaly areas appear turquoise blue. Parents should suspect the presence of the disease with the discovery of round bald spots on the scalp, ranging from the size of a 10 cent piece to that of a silver dollar, or even larger.

Since nursing care plays an important role in the treatment of this infection, Dr. Carrick says that the following printed directions for home care were given to mothers of young patients at the City of Detroit Receiving Hospital:

Home Care for Ringworm of the Scalp

This disease is contagious to other children. Because of this, bring all other children in your family who are under 14 years of age to this clinic for examination. The patient should not go to the barber shop. He should wear a clean stocking cap at all times, even to bed and while in school. As a precaution, any children in the family who do not have ringworm of the scalp should be cautioned against using the patient's comb, brush or cap, and he should sleep alone if possible.

Please live up to these rules and help to stamp out this disease, which is gaining epidemic proportions in Detroit school children. The average case of ringworm of the scalp seen during this epidemic is very resistant to treatment and usually requires several months to get well. Careful attention to the above directions and regular attendance at the clinic are essential for cure.

Treatment

1. When you get the child home, shave the entire scalp. Hand clippers may be used first if available. Be sure to boil the instruments for ten minutes after use. Cut a hole in a newspaper and place it on the child's shoulders to catch the hairs as they are shaved off. The hairs and newspaper should then be burned. The scalp should be shaved once a week.

2. At bedtime shampoo the scalp with the soap provided. It is helpful to gently massage the shampoo into

(Continued on Page 62)

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RINGWORM OF THE SCALP AFFECTS ABOUT FOUR BOYS TO EVERY GIRL

(Continued from Page 58)

the scalp with a soft brush (a used tooth brush is suitable). Then rinse and dry well and apply the salve to the entire scalp, rubbing it in well, especially on the patches of ringworm.

3. Then apply a clean stocking cap and put the child to bed. Four or five stocking caps should be made up so that a clean cap is always available. After using the cap, it should be put in boiling water for ten minutes before washing. The child should be cautioned to leave the cap in place once it is put on. If this rule is not observed, the ringworm may spread from one patch to a normal area of the scalp and thus defeat the purpose of the treatment.

4. The next morning shampoo the scalp again and reapply the salve. Put on a clean stocking cap. The child should wear this all day long, even while in school. In

cold weather, an ordinary cap may be worn over the stocking cap. Repeat this treatment every evening and morning.

5. On arising the morning the child is brought to the clinic, the scalp should be shampooed and *no* salve applied. This is important so that adequate examination under the Wood light can be made.

BOOKS RECEIVED

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CALIFORNIA MEDICINE

Index to Volume 65, June-December, 1946

KEY TO ABBREVIATIONS USED IN INDEX

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|---|---|
| (Or.)—Original Article. | (CMA)—California Medical Association Section. |
| (Ed.)—Editorial. | (I)—Information. |
| (MP)—Medical Progress. | (LE)—Letters to the Editor. |
| (CPC)—Clinical-Pathological Conference. | (BR)—Book Reviews. |
| (CC)—Clinical Conference. | (MJ)—Medical Jurisprudence. |

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TUBERCULOSIS SUPPLEMENT

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and

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In cooperation with

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Through its Official Journal

California Medicine



Printed and Edited under the direction of

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DAVID T. PROCTOR, M.D., *President*, California Trudeau Society

WILLIAM P. SHEPARD, M.D., *Chairman*, 1946 Annual Meeting Program Committee

* * *

FOREWORD: AN EXPRESSION OF APPRECIATION

The California Tuberculosis Associations are deeply appreciative of the courtesy extended by the California Medical Association in making it possible to present the papers read before the 1946 annual meeting of the California Tuberculosis and Health Association and the California Trudeau Society. It is hoped that this presentation will be of interest to general practitioners.

The California Tuberculosis Associations are anxious to continue the close and pleasant association which they have always had with the medical profession of the State, to the end that all our communities may approach the ideal level of community health.

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FACTS FOR ACTION*

WILTON L. HALVERSON, M.D., *San Francisco*

THE "Fact" most challenging to Californians is that the population, according to reliable estimates, has increased 34 per cent in the six-year period since the last census to a total of nine and one-quarter millions. Population analysts tell us that within the next two decades we will have 20 million people living within the boundaries of the state.

These estimates place an obligation upon all public health workers in positions of responsibility to examine the public health program, both official and non-official, to determine if we have in this state a sound foundation upon which can be built services which will be adequate for a greatly increased population, and, in the light of the facts we discover through our studies, to start immediately to strengthen the bulwarks against preventable disease, disability and death.

In the field of public health administration, valuable spade work has been done by the American Public Health Association. Under the leadership of Haven Emerson, the sub-committee on Local Health Units has established basic minimum standards for adequate local health services and through an extensive fact-finding survey has determined how these standards are being met in each of the 38,000 local jurisdictions of civil government in the United States. I will not speak in detail concerning this report, but every individual and agency interested has or will review it carefully. The over-all findings are basic to any consideration of public health planning, and it is important to review them at this time.

From its study of the factual material it had collected, the committee has estimated that *minimum* local public health service can be provided at the cost of \$1.00 per capita *if* the population served by the local health department is not much smaller than 50,000. If a smaller population is served—as is often the case—either the standard of service must fall below minimum health protection or the cost to the people must rise.

The multiplicity of local health units, the committee found, is the greatest stumbling block in the provision of adequate local health service. At the present time, there are 18,000 counties, cities, towns, villages, and districts in the United States attempting to provide public health services. To quote from the report:

"It may come as a shock to many that only

two-thirds of the people of our country are today under the umbrella of full-time local health protection, while approximately 40 million are excluded by horse-and-buggy political boundary lines or by the economic stringencies of the areas in which they happen to live. . . . These local health jurisdictions are inherited from the past. They came into being like many good and bad things in a young and growing country, without benefit of policy."

To remedy this situation, the committee suggests that *the county be utilized as the basic governmental unit in the establishment of full-time local health departments* and, where the population of the county is below 50,000, multi-county units be established. *A plan is proposed for the provision of full-time local health service in every area of the nation through the reduction in the number of local health units from 18,000 to about 1,200.*

In California, there are at present 42 full-time local health departments and 135 departments served by a health officer employed part-time—or a total of 177 separate local health departments. There is one bi-county health unit serving Sutter and Yuba counties and one local health district serving San Joaquin County. All other local health departments are organized on the basis of conventional local government—city or county. On the basis of the 1940 census, the population served by full-time departments ranged from about 17,000 in Palo Alto to one and one-half million in Los Angeles City. The Emerson Committee suggests that 31 full-time health units serve the entire state.

Although more than 90 per cent of the population in California lives in regions served by full-time local health departments, the northern part of the state, the western mountain region, and several large areas in the San Joaquin Valley are without full-time local health service. *The problem of extending full-time local health service to the unorganized areas is complicated by the fact that, with a few exceptions, because of sparsity of population or economic factors, it would not be feasible to establish departments as single county units—and multi-county units or districts have not proved popular in California.*

Only 10 of the 42 full-time local health departments have, during the current fiscal year, *operated on a budget equivalent to \$1.00 or more per capita*, including funds from federal and state as well as from local sources. You will recall that the committee under chairmanship of Dr. Haven

* From the California State Department of Public Health. Read before the California Trudeau Society and the California Tuberculosis and Health Association, San Francisco, April 23, 1946.

Emerson found that \$1.00 per capita per year was necessary to provide the *basic minimum* public health services. I do not have budgetary figures for the current year for part-time health departments, but I do not suppose that they have changed greatly from those presented in the committee's report for the fiscal year ending June 30, 1942, when less than 10¢ per capita was being spent for health protection in several places.

It is apparent that something fundamental will have to be done in California if we are going to have a sound foundation upon which we can build adequate public health services for all the people. There are several methods of approach that we may consider:

1. Laissez-faire, or let the local community work its problem out some way without outside interference or assistance. This method depends on the interest of local physicians, voluntary health organizations and others interested in a good public health program.

2. Formation of state health districts to administer local health services.

3. State legislation requiring the development of local health services with a mandatory minimum appropriation.

4. State appropriations to augment available federal funds for subsidizing local health services.

The subsidy principle was established in the field of public health in California when in 1915 tuberculosis hospitalization subsidy was approved by the legislature. It has worked well.

In recent years, local government has been hard pressed to secure sufficient returns from local taxes to meet all needs. Tax experts indicate that unless there is a revision of taxing methods local government will not be able to meet its present and future obligations.

The legislature has on several occasions declared the preservation of the public health to be a matter of state concern and in fact this is evident.

With these facts confronting us, it would seem logical for the state to make available a substantial per cent of the funds required for the administration of local health services when these services meet reasonable standards.

SPECIAL HEALTH STANDARDS

In addition to the matter of organization of basic public health services, there are other facts confronting us which are important in planning for action.

The general aim of the programs conducted by public and private health agencies is to prevent unnecessary sickness, disability and death. Traditionally, these programs have been chiefly concerned with the control of communicable diseases.

Thirty-five years ago, when the modern public health program was in its infancy, the 10 leading causes of death were headed by tuberculosis and included influenza and pneumonia, diphtheria,

diarrhea and enteritis, and typhoid fever. Last year in California, only two communicable diseases remained, pneumonia in seventh place and tuberculosis in eighth place. The remainder of the list was made up of the degenerative diseases of old age, accidents and conditions peculiar to the first year of life such as congenital malformation and prematurity.

When we consider the degenerative diseases and their place in the public health program, we must take into consideration the fact more people are living longer and in California particularly there is a proportionately larger number of people in the older age groups than in the nation as a whole. In the 1940 census, it was found that the median age in California was 33, the highest among the states, as compared with a median age for the nation of 29.

In this state, we have done very little through public agencies to attack the problem of the degenerative diseases. In their capacity as pioneers, the voluntary agencies have done more, and I particularly want to commend the California Tuberculosis and Health Association for its active interest in heart disease. As a result of this interest, local associations have in several instances mobilized community interest to the point of the development of programs for the control of rheumatic heart disease.

This interest was also an important factor in the passage of legislation making it mandatory for counties to set aside funds for services to physically-handicapped children, including those with heart disease.

There should also be mentioned the development of plans by the California Medical Association to provide cancer diagnostic and treatment services where needed at appropriate centers in the state.

This highlights interest in the control of cancer, the second in the list of causes of death, and comes at a time when the federal government is in the act of making funds available for the augmentation of the program for research and service in this important field. It is timely that the "community" take an increasing interest in the control of this disease.

Accidental deaths, when grouped, form the third most important cause of death for California and motor vehicle accidents alone claimed the lives of over 3,600 of our residents and placed as the ninth most important cause of death in 1945. This great drain on our resources has impelled President Truman to call a conference early in May to be devoted to devising ways and means for the stoppage of this waste. These "Facts" cry for concerted action by both official and voluntary agencies and individuals, for what doth it profit a society that saveth its children from diphtheria to be slain in their manhood and womanhood by the automobile.

Mental illness is a major drain on our society. Approximately one-half the available hospital beds in our state are set aside for the mentally

ill. The causes of mental illness are not understood and little has been done to provide early diagnosis and preventive treatment.

These facts also call for action and some action has been taken. The State Department of Institutions has become the State Department of Mental Hygiene, and plans have been laid to rejuvenate the program placing emphasis on early diagnosis and therapy.

The State Department of Public Health has studied the feasibility of the development of preventive services, as far as the known facts will permit. It is planned that a small staff trained in pediatrics and psychiatry will be available to consult with medical groups, health departments and school health services on the psychosomatic aspects of care, especially as it relates to children. As more trained workers in this field become available, local programs will be fostered.

We have it within our power to knock tuberculosis out of the ten leading causes within the next few years. Due largely to the efforts of the National Tuberculosis Association, Congress has made federal funds available for tuberculosis control. Studies which the California Tuberculosis Association has made of the problem and program in a number of counties are of tremendous assistance to the State Department of Public Health in determining with local health departments how California's share of the federal appropriation can be used to greatest advantage. Working together, within a relatively short period of time official and non-official agencies should succeed in this state in eliminating tuberculosis as an important public health problem.

What should be the measure of this allotment of time to control—yes, to eliminate—tubercu-

losis as a major disease problem? Do we know enough about the variables and the tools at hand to say how soon the job can be done?

We now have effective tools for case-finding. We have a sufficiently effective method of treatment provided we find the cases early. We have the unqualified support of public opinion to the extent necessary.

A survey of the population within the next five years and the augmentation of community facilities for follow-up, isolation and treatment to provide care to the degree needed for the cases found. This action will require the combined efforts of all, including the medical profession, tuberculosis associations and health departments.

At the same time, the facts we have briefly scanned relating to heart disease, cancer and accidental deaths, as examples, are of such import that, while our line troops are delivering the knockout punch to tuberculosis, our combined chiefs-of-staff must be laying the strategy, assembling the material and gathering the forces for the campaign ahead. It would be poor planning to say that these campaigns must be held until tuberculosis is defeated, just as it would have been poor strategy to withhold attention from the Pacific until after V-E Day. We have the resources and facilities to wage the campaign where the need is.

Our course of action is clear:

1. The extension of basic local public health services to all the people in every section of the state.

2. The development of services adequate to eliminate tuberculosis and to reduce the drain on our communities now resulting from such conditions as heart disease, cancer, accidents.

Trends of Tuberculosis Association Programs*

LOUIS I. DUBLIN, PH.D., *New York City*

IT WAS almost 23 years ago, on the occasion of the annual meeting of the National Tuberculosis Association in Santa Barbara in 1923, that I last addressed a group of tuberculosis workers in this part of the country. My subject then was "The Causes of the Recent Decline in Tuberculosis and the Outlook for the Future." There may be in today's audience a number who were present on that occasion; but I can identify only a few. I may, with propriety, therefore, recall that in that paper I took stock of the situation in the

field of tuberculosis and considered the facts on the incidence and mortality of the disease in relation to sex, age, race, occupation, and other factors. I discussed the efficacy of the various therapeutic procedures of the period, and more particularly, the effectiveness of our sanatoria.

At the end of my talk I was bold enough to project an outlook for the future. I was disposed to be optimistic. For, in the period just after the great influenza epidemic, there had been a precipitous decline in the death rate from tuberculosis. I judged that the favorable trend would continue and that, altogether, we could look forward to the time when the disease would be reduced to a problem of minor dimensions in most parts of

* From the Metropolitan Life Insurance Co., New York, N. Y. Read before the California Trudeau Society and the California Tuberculosis and Health Association, San Francisco, April 23, 1946.

the country, even within the lifetime of those I was addressing.

It is a pleasure to stand before you today and to say that my optimism has been broadly justified. The trend in the intervening period has been very much in the direction which I then predicted.

Certainly, we have made enormous strides in these 23 years. Back in 1923 the death rate from tuberculosis in the country as a whole was about 95 per 100,000. In over a third of the states, the rate was over 100. Today, the country's death rate is below 40. Only one state, Arizona, has a rate over 70, and only five other states have rates of 50 or over. In 11 states, the rate is below 30, and in six, below 20. Today, tuberculosis is eighth in rank among the causes of death. The death rate for white females is a shade under 25 per 100,000 which is about 30 per cent less than from diabetes. In short, these 20 odd years have seen an increasingly effective national movement which has cut the tuberculosis death rate close to 60 per cent in the nation as a whole.

These facts make it easy to understand why you have asked me to discuss the "Trends of Tuberculosis Associations Programs" and to consider among other things the future of the use of the Christmas Seal Funds. These matters are now mooted the country over. I firmly believe that we have arrived at a point in the campaign when we should take stock anew and, in the light of current facts, so shape our activities as to make the most effective use of our personnel and funds in the final attack on tuberculosis. I am delighted to have this opportunity to exchange thoughts with you on this problem and especially here where so much that is constructive and vital is going on. For, in California, you have had a strong and progressive organization—well led over many years, ready to experiment in new ways, and what is most important, you have been ready to take a broad view of the part which the tuberculosis campaign plays in the public health program as a whole. You have handled your difficult wartime tuberculosis problems with great vigor, and considering all the wartime limitations on equipment and personnel, with great success. It has been an inspiring performance.

Our tuberculosis campaign has all along made adjustments to changing conditions. Because of the gains made, the scope and type of activities of many tuberculosis associations today are very different from what they were 25 years ago. For one thing, the voluntary agencies have succeeded far beyond their expectations in stimulating the organization of effective official services in the campaign against the disease. In the early 1920's there were relatively few states which had separate agencies specifically devoted to tuberculosis control. Today, every state in the Union has an agency of this kind, usually as a distinct division of the State Health Department, and similar agencies are found in some of our largest cities. In the 1920's there was little or no direct Federal participation in the general field of tuberculosis control. Today, a strong Division is being built up

in the United States Public Health Service, staffed by competent workers and supplied with large funds to supplement the operations of the states. In a word, the official services have been widely and intensively developed and they are now carrying on many of the functions formerly carried by the voluntary agencies. It has accordingly become necessary for more and more of the voluntary societies to revamp their programs by dropping some activities and taking on new ones, or by concentrating their efforts on some special phase of the problem.

At the same time, the tuberculosis societies, as a part of the whole voluntary health movement, have grown enormously in their capacity to serve. There are today many more local societies than there were in 1923 and they are more adequately supported by the public. There are at this time about 2,800 affiliates of the National Association. In 1923, Christmas seal sales totaled \$4,255,000. In the last campaign year they exceeded \$15,000,000. The American people have responded exceedingly well to the continued appeal of our movement and have made increasingly large contributions to it.

It is, therefore, opportune to consider with you the trends in the programs currently operating. It is clear that these programs must vary considerably from place to place to correspond to differences in local conditions. I have already indicated the marked differences in the states where the death rates vary all the way from over 100 per 100,000 in Arizona to as low as 12 in Utah. In our larger cities, much the same range is found. I wish it were possible to review with you what the actual programs of tuberculosis associations are in the various parts of the country and to discover what correlation there is between the type of program of each society and the level of the death rate in its area. I regret that this information is not uniformly available. For the purpose of our discussion, however, I can illustrate by considering the situation in two cities for which are very different in their local tuberculosis picture. I have in mind San Antonio, Texas, and Syracuse, New York.

In San Antonio the death rate according to reliable data is of the order of 150. Obviously, there still is very much the same basic job to do there as there was the country over, in 1923, namely, to bring home to the people the elementary facts with regard to the disease, to stimulate the development of the necessary clinical and sanatorium facilities for diagnosis, follow-up of contacts, and treatment of active cases. Last year San Antonio raised \$31,000, or 8.6 cents per capita. This money is being devoted to the fundamental tasks of telling the public how tuberculosis spreads, cooperating in case finding programs, and in educating the public and community leaders in the extent of their local tuberculosis problem and in the need for adequate clinical and sanatorium facilities. It would be amazing indeed if every dollar raised in San Antonio could not be used profitably in such an out and out tubercu-

losis campaign. If I were a citizen of a community like San Antonio, I would certainly urge that every possible effort of the voluntary and of the official agencies be directed against this scourge.

On the other hand, in a community like Syracuse, where the death rate is 30 per 100,000, we find a very different setup. The local affiliate of the National Tuberculosis Association, the Onondaga Health Association which serves the county in which Syracuse is located, conducts not only an effective tuberculosis eradication program, but an extensive general campaign including social hygiene, cancer prevention, mental hygiene, child health, and virtually every element of a broadly conceived health promotion service. It is encouraging that a community like Syracuse which has accomplished so much in the tuberculosis field, still continues to be actively and enthusiastically supported by the public. In 1945, the Onondaga Health Association enjoyed a per capita income of close to 18 cents (in part derived from Community Chest grants). This is a very generous figure indeed for a tuberculosis agency. Nothing has been lost by the broadening of its program. On the contrary, much has been gained through a closer affiliation with the Community Chest and Council which also help to support the non-tuberculosis activities. In this community at least, these two methods of financing continue side by side with good relations and with mutually advantageous results.

These two cities can serve as pegs on which to hang the rest of our discussion. Clearly, local conditions are not all white or all black. Because of the great variations in our states and cities, it is up to each tuberculosis society to take note of the local picture and to adapt its program accordingly. A great many associations have already shown readiness to broaden their health program. The National Tuberculosis Association has taken note of this tendency and has for some time made it possible for those affiliated societies that were ready, to obtain approval through their state organizations for extra-tuberculosis work. Thus, the state affiliates in New York, California, Oregon, and in seven other states have already received the approval of the National Association to proceed along these lines. I am greatly encouraged by the recent trend of National Association policy in this matter. As one who has been active in the tuberculosis field for many years and closely associated with the operations of the Association, I have long felt that there was a policy of over-caution in granting permission to affiliates to carry on extra-curricular activities. This bridge has now been crossed. This was accomplished last year in the adoption of the Report of the Joint Committee on Programs of Tuberculosis Associations under the leadership of President Ross and of Drs. Amberson and Shepard of the National Tuberculosis Association, and of Mr. Auerbach of the National Conference of Tuberculosis Secretaries. This report embodies a much more liberal policy in this field. As I understand

it, the National Association actually undertakes to encourage those local agencies operating in communities which have low tuberculosis rates and adequate official control programs, to employ some of their funds for activities other than those classified as tuberculosis work. The door has been opened very much wider and it is now up to the affiliates to take advantage of the opportunity and to prepare themselves to carry on the broader work which in many communities is clearly called for.

The problem thus has shifted very largely from the national to the local scene, and it is there that I am sure there is much room for study and enlightened action. I can perhaps best illustrate what is in mind by referring to my experience as a member of the Board of such a local Tuberculosis and Health Association. I have been a member of this Board continuously for more than 30 years. For some time now, I have recommended to the Budget Committee such extensions of the program as could profitably be undertaken. An effort was made to broaden the base of operations, and activities in such fields as venereal disease, heart disease, dental hygiene, industrial hygiene, and diabetes, did find a place in the program, thus justifying its name as a health as well as a tuberculosis society. But little by little this program has been whittled away because the Budget Committee has failed to support these additional activities anywhere near adequately. First, the work in diabetes was dropped and was taken over by a new agency which has since been struggling for public support. More recently, the heart disease program was dropped, and thus another agency was compelled to seek support on its own account. Relatively little is available now for venereal disease control and for dental hygiene. Thus, in the current budget of \$376,000, only \$4,100 is available for dental hygiene, and \$17,500 specifically designated for social hygiene. Some additional moneys for these services are available under such other designations as Health Education, General Services and Administration but the amounts involved are small. The present budgetary policy is almost tantamount to discontinuing these services and impelling the groups that are especially interested in them to go out on their own. In the past, the excuse given by this Association for curtailing non-tuberculosis work was the alleged opposition of the Board of Directors of the National Tuberculosis Association. Whatever substance this excuse may have had, and I think it was exaggerated, has now disappeared.

As a result of its policy, moreover, the local Association has lost a great opportunity for service and it has alienated the interest of many influential lay and professional leaders. It could have been the spearhead of a movement to coordinate the Voluntary Health Services in a great metropolitan center. Instead, it has hindered such action, and in the end, will be just one more agency, even if a large one, in such a coordinated group.

Our job today in the state and local affiliates is, therefore, to overcome the inertia or opposition that either represent a carry-over from the days before the Board of the National Association had broadened its policy, or reflect the ingrained conservatism of the local leaders or the tuberculosis secretaries. In many of these state and local affiliates, the Board of Directors is composed largely of physicians interested primarily in tuberculosis. Generally they determine policy, and their decisions are often restricted by their special interest. There is need, far and wide, for a realization that the tuberculosis societies are not professional medical groups but are essentially public institutions. As so often happens, the professional group has come to be the dominant, even the sole voice. I think we must change the trend and, in a manner of speaking, turn the societies back to the public which supports them. The time has come for a larger representation in the directing Boards, of professional and lay persons who have a broad outlook in the fields of public health and social welfare, as well as a live interest in finishing the tuberculosis job.

The National Association, within proper limits, can do much to stimulate such a movement. In addition to its present broader policy, it can well afford to promote the extension of the general activities of its affiliates wherever circumstances warrant. It could now profitably make a careful survey of the actual activities of its member societies. In this way, it would be possible to determine where and how rapidly broader health programs can be undertaken. Indeed, a knowledge of the local facts will itself expedite the development of better programs.

I would emphasize at this point that there is no set pattern for extension of these supplementary activities. Just what new responsibilities a local society can assume, or how it should operate in a new field will depend largely on local circumstances. In many cases, the health field is wide open and one or two major neglected health problems may be all that can be handled effectively. In some of the larger cities there are other organizations already working in specific health fields, and there the problem is either to pick out some neglected field for cultivation or to work in close cooperation with the other societies. In communities where there is good coordination of the activities of voluntary health agencies, the problem may be largely a matter of helping to organize or finance a useful project on which one of the other agencies needs help.

Paralleling such a program by the National Tuberculosis Association for promoting the expansion of extra-tuberculosis activities of its affiliates, the trend of the times calls for a re-study of the relationship of the National Tuberculosis Association to the other health agencies associated with it in the National Health Council. Obviously on the national level, the major concern of the National Tuberculosis Association must be in its own field. Yet, the effectiveness of

the national health agencies in their attack on the health problems of the nation would be greatly strengthened by increased coordination of the work of the national bodies. In line with their common interests, there are many fields in which they can work together, as, for example, in the promotion of health education and of better housing. Nationwide projects and studies in the fields of health and disease would be done better if the national groups involved joined together in such efforts. A variety of joint field services could be launched over the country. There are common grounds of interest in personnel training which could be developed. Fund raising, by joint action, could be put on a sounder and more efficient basis, and in view of the lack of relationship between needs and resources, the more adequately supported agencies might agree to help out their poor relations. After all, whatever our specific interest is, our common objective is to raise the health level of the American people.

It would be good statesmanship and good public relations for the National Tuberculosis Association and the other agencies to go forward along these lines. The public is prepared for such a step and would welcome it heartily. I need hardly tell you what a stir has been made in our thinking by the publication of the Gunn-Platt report.* This is a down-to-earth study of the voluntary health movement pretty generally over the country. It is no theoretical report, but represents rather the matured observations of two skilled men working with an advisory group of proved leaders. Their findings represent a good cross-section of the condition and activities of the many voluntary health agencies. The work was subjected to careful scrutiny and thorough criticism of all parties interested. The printed report can safely be used as a guide to the future operations in the voluntary health field.

One of the main conclusions of this report is that the people in our local communities are becoming more and more critical, if not resentful, of the multiplicity of drives for the support of voluntary health and welfare agencies. Many are fed up with the importunities of the dozens of appeals for funds. There are in too many places too many societies. By the very nature of their multiplicity, they are weak, inadequately administered, and unable to command the leadership or resources to do an effective job. Unless we are all hopelessly mistaken, there is a wholesome trend in the direction of correcting this situation by coordinating effort on the local level and thus strengthening societies to the point where they can be more effective. It is, therefore, all the more desirable and opportune for local tuberculosis societies to take note of the situation and wherever it is possible, to expand their functions or to work closely with other agencies on problems of

* Selskar M. Gunn and Philip S. Platt. *Voluntary Health Agencies, An Interpretive Study*, Ronald Press, N. Y., 1945.

mutual concern. This would make them truly effective tuberculosis and health associations.

In my own State of New York, we have perhaps the most effective demonstration to the nation of the wisdom of the proposed setup for a tuberculosis society. I refer to the State Charities Aid Association under the brilliant leadership of Homer Folks and George Nelbach. This Society's Committee on Tuberculosis and Public Health is the affiliate of the National Tuberculosis Association for New York State (outside New York City and Long Island). As far back as 1913, it began to extend its program of activities outside the field of tuberculosis. In that year it used funds from the 1912 Seal Sale to promote general health legislation. It also organized an effort to secure the enactment of far-reaching changes in the Public Health Law of the state. This led to the reorganization of the State Health Department, the trebling of its appropriations, and to the great improvement of the official health services. In 1921, the committee promoted the enactment of a statute giving the County Boards and Supervisors the power to create County Health Departments, with full-time health officers, and the next year, promoted the passage of the Act under which the state adopted the policy of matching dollar for dollar the public health appropriations made by the County Boards. In 1926, the Association's Tuberculosis Committee participated in the drive to eradicate diphtheria. In 1932, Christmas Seal funds began to be used in the fight against venereal diseases. Last year, the Association obtained authority to use funds for heart disease work and already two local groups in the Association have entered that field. A beginning has also been made in health education, in cancer and mental hygiene. This expansion of the Association's activities has not diminished one iota either the effectiveness of the tuberculosis program or the support given to the agency. Quite the contrary! Since 1940, the sale of Christmas Seals in the area served by the agency has increased from \$469,000 to a little over a million dollars in the 1945 campaign, and the per capita

income from Christmas seals, 17 cents, is among the highest in the country.

You in California also have gone through the same development that I am urging on the entire movement. For many years now you have functioned both as a tuberculosis and health agency, although it was only two years ago that this was recognized in the name of the association. Broadening your scope has caused you no loss of prestige. The effectiveness of your tuberculosis program is undiminished. Financial support from the public has continued to improve. Thus, everything has been gained and nothing lost.

I am tempted to say a few more words about your situation, as an outsider sees it. Certainly you have a difficult and complicated health problem with your diverse race stocks and their high tuberculosis rates, and the popularity of the state as a place to take the cure or to convalesce. War-time migration and the influx of Negroes has not made it any easier for you. You have a real tuberculosis problem which calls for concentrated effort. At the same time you have the wisdom to see that the tuberculosis program itself is strengthened by a broad frontal attack on the health problem as a whole. Yours has not been a narrow vision. I sincerely hope that you will continue to work along these lines and to serve as a brilliant example of the new and more effective approach to the problem of tuberculosis control.

To sum up, then, it is my considered judgment that the future work of the tuberculosis societies should be broadly based. Such a policy would be wise in view of the continuing improvement in our tuberculosis situation. We must not wait too long lest we find ourselves in the embarrassing position of attempting to raise large sums of money and conducting campaigns which lack sincerity and the elements of reality. It is far better that we ourselves take leadership in widening the scope of our health operations rather than be pushed to it by a critical public. Now is the time for the movement to take the initiative, in anticipation of achieving our goal—the eradication of tuberculosis from our country.



The Medical Future of Tuberculosis Control*

H. CORWIN HINSHAW, M.D., *Rochester, Minnesota*

TUBERCULOSIS control is dependent upon early diagnosis, segregation of cases, and adequate treatment. Tuberculosis often produces no recognizable symptoms during its early stages, hence the disease must be sought for among persons who are apparently well and among those who have other diseases or non-specific complaints.

The absolute necessity of an x-ray examination of the chest as an essential part of every complete physical examination has been fully established. Physicians have learned that it is not possible to declare a person to be physically fit unless an x-ray of the chest has been taken. Surgeons have learned that the possible risks of a contemplated operation have not been fully studied unless a routine chest x-ray has been taken. Obstetricians have learned that the estimation of the risks of child bearing and the proper protection of the infant require the routine use of chest x-rays for every expectant mother. Patients are learning to expect the chest x-ray as a routine procedure on entering a general hospital regardless of the nature of their ailment, just as they expect to submit to the routine examinations, including blood studies, urinalysis and general physical examination. The future of tuberculosis control is dependent upon strict adherence to this principle, and in addition, such routine x-rays reveal non-tuberculous disease of the heart and lungs which would otherwise have escaped early detection.

The medical future of tuberculosis control is dependent upon research.

Vastly greater expenditure of private and public funds is justifiable, if our belief is correct that research can develop more effective and more rapid methods of treating tuberculosis. Sufficiently encouraging results have been obtained with several chemotherapeutic drugs to make it appear altogether probable that drug treatment of tuberculosis will become established before many years.

A completely suitable drug of wide applicability has not yet been developed, but one drug known as streptomycin may be available in limited amounts within the next year, and it appears probable that streptomycin may prove to have some limited but useful applications to some types of tuberculous infection.

The public should be cautioned not to expect that this drug will have miraculous properties

comparable to those observed in the case of penicillin treatment of acute diseases such as pneumonia. It should also be emphasized that much more fundamental research is necessary in this field.

Tuberculosis has become a surgical disease in many cases, and the future will see greater developments along this line. At the present time there is urgent need for more surgeons with the special training and capabilities required for thoracic surgery. It is hoped that more surgeons returning from military service will obtain the necessary training and enter this important field.

Evidence is accumulating to suggest that some degree of immunity to tuberculosis may be produced by artificial methods. While wholesale 'vaccination' is not likely to be practiced in the United States, it is possible that such methods may be required to stem the flood of tuberculous infection which is sweeping over many other nations.

War and famine lead to pestilence, and the greatest plague which is now sweeping the devastated nations of the earth is tuberculosis. At present the incidence of tuberculosis is so great in many European nations as to make treatment by conventional methods of sanatorium care impossible of attainment. No adequate control program has yet been proposed to deal with this most serious situation.

Tuberculosis remains a serious problem in the United States. During the past four years tuberculosis has killed approximately the same number of citizens of this country as were killed by the war. Unfortunately many of these were young individuals, and many others are doomed to a life of partial or complete invalidism. Most important is the fact that tuberculosis, unlike such killers as cancer and heart disease, is a *contagious* disease and one affecting persons during most productive periods of life, and it is preventable to a much greater degree than are some other important causes of death. Tuberculosis is the only widespread truly preventable disease of contagious origin which is not well controlled today in the United States.

If tuberculosis control measures are adequately supported during the years to come, it is possible that this disease may become as rare as typhoid fever, diphtheria and small pox. The date when this degree of control is attained will depend upon the vigor with which the present campaign is carried out by public health workers, physicians in practice, and research scientists, and upon the financial support which voluntary and governmental agencies supply.

* From the Mayo Clinic, Rochester, Minn. Read before the California Trudeau Society and the California Tuberculosis and Health Association, San Francisco, April 23, 1946.

Evolution of Chemotherapy in Tuberculosis*

H. CORWIN HINSHAW, M.D., WM. H. FELDMAN, D.V.M., *Rochester, Minnesota*

TUBERCULOSIS is a disease of such medical, social and economic significance that great effort has been expended over a period of many years in search of specific remedies.

Hundreds of chemical compounds are capable of inhibiting or destroying the bacillus of tuberculosis in test tube cultures. Unwarranted enthusiasm has frequently resulted from reports of additional substances which possess this property.

Efforts to control tuberculosis in experimentally infected guinea pigs by means of chemical substances which were found to inhibit the bacillus in cultures have been underway for over 50 years. All reports have been discouraging, until during the past six or seven years when several compounds have proven to be capable of partially or totally arresting the course of tuberculosis in experimentally infected animals. These results have now been confirmed in a sufficient number of laboratories, and experiments have been adequately controlled, to make the conclusions quite definite.

Until 1944, all of the drugs found to be effective against tuberculosis of guinea pigs were similar and were derivatives of diaminodiphenyl-sulfone. The first of these and the most effective was "promin." Later "diasone" was developed but it is now believed that diasone and promin are converted into essentially the same substance in the animal body. Several other and similar substances are known but they apparently possess no advantage when compared with the original promin. Subsequently "promizole" was developed and it was hoped that this would have the advantage of reduced toxicity. All of these drugs belonged to the "sulfone" family of chemical substances, and are only distantly related to the familiar "sulfa" drugs which belong to the "sulfonamide" family. The latter possess much less activity against the bacillus of tuberculosis and are unable to arrest the disease in guinea pigs.

In 1944 an antibiotic substance called "streptomycin" was isolated from cultures of a soil micro-organism (*Streptomyces griseus*). Although several other antibiotics are known to inhibit the bacillus of tuberculosis in test tube cultures, this is the only substance yet announced which is shown to be capable of overcoming well established tuberculosis in experimentally infected guinea pigs and mice. These results have now been confirmed in at least three laboratories.

(Mayo Clinic, U. S. Public Health Service, and Northwestern University). Similar confirmation will shortly appear from several other laboratories.

Efforts to utilize these results in treatment of human tuberculosis have been undertaken with each of these drugs as soon as adequate pharmacologic information is available. In general, the sulfone drugs have not produced sufficiently consistent results to confirm some of the early and optimistic reports. This may be due to the fact that human beings do not tolerate sulfone drugs in doses comparable to those administered to guinea pigs. Streptomycin, however, is tolerated by human beings fully as well as by guinea pigs. While streptomycin is more toxic than penicillin, it is less toxic than most of the commonly used sulfonamides.

Streptomycin has not been available in sufficient quantity to permit a complete evaluation of its possible place in treatment of human tuberculosis. Preliminary observations have been definitely encouraging, especially in some of the more unusual types of pulmonary and extrapulmonary tuberculosis. It appears that streptomycin has only a limited and only a suppressive action upon the tubercle bacillus in the human body and that it does not destroy the bacilli. The results are not comparable to the miraculous cures of some acute diseases, such as pneumonia, when these are treated with such drugs as penicillin. This contrast may be due to the destructive and irreversible changes in tissues produced by tuberculosis and to the less intense and less prolonged suppressive action of streptomycin.

It is recommended that streptomycin be withheld from general distribution through commercial channels for treatment of tuberculosis until the preliminary observations described can be confirmed in several institutions and expanded on an adequate scale. It is hoped that the drug will be available for research in steadily increasing amounts within the months to come. The drug is distributed by the National Research Council in Washington, D. C., and cannot be obtained from any other source. At present almost the entire output is being diverted to a study of its effects upon diseases other than tuberculosis.

It is extremely important that patients who have tuberculosis should not refuse or postpone sanatorium care and surgical treatment because of uncritical estimates of the possibilities of drug therapy which are occasionally publicized. Undoubtedly human lives have been lost because of

* From the Mayo Clinic and the Mayo Foundation, Rochester, Minn. Abstract of a paper read before the California Trudeau Society and the California Tuberculosis and Health Association, April 24, 1946.

such errors. Patients and physicians may be assured that the ethical principles which have been developed for distribution of medical research information will be rigidly adhered to because these principles are designed for protection of patients against premature enthusiasm. The American Trudeau Society (Medical Section of the National Tuberculosis Association) and the corresponding State organizations will continue to keep the medical profession informed of any developments which may be put to practical use. Research workers in this field of endeavor will continue to exchange information freely through publication in medical journals, presentations be-

fore scientific societies, and through personal consultations among those engaged in such work.

While a practical and widely applicable chemical remedy for tuberculosis, such as might compare favorably with drugs used in acute diseases, has not been fully developed; we can report definite progress, especially in the past two years. It is hoped that a postwar "boom" in research may take place and that adequate support will be made available to permit more rapid progress in development of newer remedies for treatment of tuberculosis. The medical, social and economic possibilities of such research would fully justify great expenditures of money and effort for prolonged periods of time if necessary.

Air Borne Infection in Tuberculosis*

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IN the early years following Koch's publication of the etiology of tuberculosis, the feeling was prevalent that tubercle bacilli were ubiquitous, that they were everywhere present, and that consumptives exhaled them in their breath. This theory brought about a sense of hopelessness as far as the prevention of infection was concerned. Cornet was one of the leaders in dispelling this idea. He cited experimental proof that the breath of consumptives does not contain tubercle bacilli. On the other hand he and others were able to show that the bacilli were frequently present in the dust of patients' rooms and even in that of public buildings, but not in the dust of streets exposed to sunshine. Cornet and his school felt that inhalation of dust containing dried sputum or bacilli that had settled out of the air was the chief means of infection. Propaganda based on this theory resulted in a great improvement in public hygiene.

Flügge was a leader of the group that supported the theory of *droplet infection*. That is, it was postulated, droplets of sputum coughed from the chest of the tuberculous were inhaled into the lungs of the victim. This idea became rather generally accepted as indicating the chief means of infection until Bruno Lange and others demonstrated that cough droplets, as a rule, cannot be inhaled into the lungs but will lodge on the mucous membranes of the nose and throat. On the other hand, it was shown that fine dust is readily breathed directly into the lung alveoli. Lange interpreted the role of cough droplets in this manner: they are sprayed onto the clothing, bed clothing, furniture and floor where they dry. Then, following mechanical agitation such as

making the bed or sweeping the floor a fine dust containing tubercle bacilli rises into the air and enters the lungs with respiration. This view goes back to Koch's original conception of the transmission of tuberculosis.

Calmette and his school have maintained that tuberculosis infection occurs largely by ingestion, that swallowed bacilli pass the intestinal mucosa, reach the blood stream via the lymphatics and then are carried to the lungs. There is considerable evidence, however, to show that it takes a much larger dosage of tubercle bacilli, perhaps a thousand times as large, to introduce infection by way of the gastrointestinal tract or by way of the nasopharynx than by direct inhalation. Furthermore, such infections tend to be relatively benign.

In 1936 Wells and Wells set forth a most interesting theory that may answer the objections to the idea of droplet infection. They found that droplets less than 0.1 mm. in diameter completely evaporate before they have settled the height of a man, leaving a dry nucleus containing bacteria. These droplet nuclei are exceedingly light and may float in the air for hours or even days. They are fine enough to be inhaled directly into the alveoli of the lung. Although some pathogenic bacteria die out in an hour or so under these conditions, the theory takes on added significance as applied to infection in tuberculosis because of the toughness and prolonged viability of the tubercle bacillus.

The Wells devised an instrument called an *air centrifuge* for sampling the bacteria in the air and growing them on culture medium. They found that within a few minutes after people enter an empty room bacteria characteristic of the mouth and throat may be isolated from the air. They believe that air can be polluted in much the same way as water, is polluted, that the prevalence of upper respiratory infections in the winter is be-

* From the Barlow Sanatorium, Los Angeles, California. Read before the California Trudeau Society and the California Tuberculosis and Health Association, San Francisco, April 24, 1946.

cause the generally poor ventilation at that season does not remove the droplet nuclei from the air.

Wells and Lurie developed a method of experimentally infecting animals by means of droplet nuclei and were able largely to prevent such infection by ultra violet radiation of the polluted air.

At Barlow Sanatorium we were unable to demonstrate the microorganisms by culture in sweepings or in dust caught with petri dishes or in dust from bedside articles and furniture from the rooms of positive patients. We felt this might be due to the bactericidal action of daylight and showed experimentally that tubercle bacilli exposed to unfiltered north light die out rapidly, in a matter of a few hours or days.

In 1937, Pressman reported some extraordinary results from his attempts at isolation of tubercle bacilli from the air-borne dust of several sanatoriums. He set out dishes containing normal saline solution, on the floor, in the four corners of the patients' rooms. At the end of a week, the dust collected was examined for tubercle bacilli. Eighty-seven per cent of the samples were positive! At the same time he was unsuccessful in attempts at isolation of tubercle bacilli from the air with the Wells air centrifuge.

Bogen and Dunn using Pressman's technique at Olive View Sanatorium obtained quite different results. Only about 5 per cent of the dishes set out were positive and these were from the admitting ward housing new, uninstructed patients or from the sputum examination laboratory.

It is more difficult to demonstrate tubercle bacilli in the air. True, guinea pigs kept in tuberculous environments may develop tuberculosis (Rogers), but this happens less frequently if their cages are kept well above the floor (Heyman). But direct isolation of the microorganisms from the air has been rarely accomplished. Augustine succeeded in one out of twenty-four tests, using the MacConnell and Thomas *aeroscope*. This is a device for bubbling the air through a fine silk diaphragm under water. An average of seven cubic feet of air was processed for each test.

A good deal has been learned about the air-borne transmission of other diseases. Hart demonstrated pathogenic bacteria in the air of operating rooms, showed them to be an important source of wound contamination. He showed how the air could be sterilized with ultra violet irradiation causing an 85 per cent reduction in wound infections. After the adoption of the Dick aseptic technique at the Cradle, a large infant nursery, Sauer and others reported virtual elimination of hand-borne contagion such as enteritis and impetigo. But upper respiratory cross infections continued unaffected, finally being eliminated by air conditioning and ultra violet light barriers. Harris and Stokes reduced the bacterial content of the air and the incidence of such upper respiratory cross infections as coryza, pharyngitis, bronchitis and otitis media in a convalescent home by the use of glycol vapors. Air-borne streptococci

were reduced 97.5 per cent and cross infections such as otitis media in measles wards were diminished from 73 to 19 per cent by oiling floors and bed clothes by Wright, Cruikshank and Gunn. Robertson and associates of the Commission on Air-borne Infections of the U. S. Army found that a 1.5 to 2.5 per cent oil content in bedclothing reduced the number of bacteria liberated during bed making about 70 per cent.

Wells pointed out that ventilation is a potent factor in removing droplet nuclei from the air. Thus with windows closed, seepage provides up to 10 turnovers of air per hour, ventilating systems up to 25 and open windows 25 to 100. Ultra violet irradiation of the upper air is equivalent to removing the entire ceiling.

The various methods used to isolate bacteria from the air may be classified as follows:

1. Filtration. These are generally inefficient due to absorption losses.
2. Impingement. This includes gravity plate and dish as well as the air jet methods.
3. Bubbler devices. The air is bubbled through liquid.
4. Atomizer devices. A spray removes bacterial particles from the air.
5. Electrostatic. Bacteria are precipitated on a charged plate.

The highest counts have been obtained with the bubbler and atomizer devices (DuBuy and Hol-laender).

Three series of tests were run in which the technique varied slightly. Dishes were set out in the four corners of the rooms on the floor for seven days. The collected dust was processed for smear, culture and animal inoculation. The patients in the hospital rooms had been thoroughly instructed in hygiene. Proper sputum disposal and mouth covering during cough were insisted upon. Beds were made once a day, changed twice a week. Dusting was done with a damp cloth once a day. The floors were cleaned daily with sweeping compound and a brush type broom and waxed once a month. The windows were generally kept open.

Summary: A total of 26 tests were run, using 97 dishes. There were seven tests in the laboratory and animal house, 19 in hospital rooms housing a total of 36 patients. All were negative for living tubercle bacilli.

AIR FILTRATION TESTS

Air was sucked by means of an electric pump through two tightly packed cotton plugs arranged in parallel. The amount of air passing through the filters was measured by means of a gas meter. The air intakes were placed at the level of the patients' head about three and one-half feet away.

The rate of suction varied from 40 to 50 cubic feet of air per hour. The duration of the tests varied from 9 to 28 hours with an average of 15 hours. It was particularly arranged for the tests

to run through the period in the morning when the patient would be doing his major coughing, when the beds were being made, and when the room was being swept.

At the end of the test the cottons were extracted by shaking thoroughly with sodium hydroxide. Then the squeezed out fluid was processed for culture and animal inoculation. In the last three tests the squeezed out cotton plugs were themselves cultured in glycerine broth for tubercle bacilli.

Seven tests were run in seven hospital rooms housing ten patients. There was at least one strongly positive, open, case of tuberculosis in each room. An average of 723 cubic feet of air per test was run through the filters. All tests were negative for tubercle bacilli by culture and animal inoculation.

This device was described in 1943 by Moulton, Puck and Lemon. It is made of Pyrex glass. The air enters through a nebulizer containing sterile water. A fog-like spray is formed in the first chamber to wet the dust particles. The air then passes into a second chamber where it bubbles from fine holes through sterile water. The bacteria presumably are caught in the second water reservoir and may be recovered by culture.

These tests were run in five rooms housing six patients. The average run was six hours, an average of 53 cubic feet of air being tested per room. In every case the cultures and guinea pigs were negative for tubercle bacilli.

DISCUSSION

If droplets cannot be inhaled into the lung alveoli, if they carry only 31 inches and if emission of droplets is prevented in almost all cases by mouth covering, direct droplet infection can play only a minor role. But this is not entirely true. Some droplets are fine enough to penetrate the lungs. Recent photographic evidence brought forward by Jennison shows that sneeze droplets may travel as far as 12 feet. Not even all so-called trained patients consistently cover their mouths during cough. A survey at Barlow Sanatorium showed that 25 per cent occasionally failed. Furthermore, there is evidence that mouth covering does not necessarily stop all droplet emission. In spite of these exceptions it would seem that direct droplet transmission is not of major importance except in intimate situations such as obtain between mother and child.

Droplet nuclei are another story. They are readily inhaled into the lungs. They may fill the atmosphere of the room and may remain there for hours. Their proven role in other conditions suggests they may be of major importance in the transmission of tuberculosis.

Settled dust is probably less a source of danger now than at the turn of the century as a result of improved hygiene. In these times patients are not apt to spit on the floor while methods of cleaning are more efficient and less dust raising. In the same way infectious dust arising from cough droplets dried on clothing and bed clothing

is probably not as common now as at the time of Lange's researches. The indoctrinated patient is not likely to spray droplets freely on his surroundings. Yet we know that bed clothing can and does become soiled with sputum, especially where there are terminal cases.

In the case of settling dust neither Bogen's work nor ours supports the high incidence of positive findings reported by Pressman. Weaknesses in the technique, drying of the salt solution and exposure to the killing action of unfiltered daylight, probably acted to diminish our success in isolating live tubercle bacilli. Certainly the few positive results obtained by Bogen and ourselves indicate this settling dust to be a definite source of infection.

The remarkable reduction in the air content of other pathogens and the reduction in infections due to them by *anti-dust measures* suggest that dust may still play a major role in the spread of tuberculosis. The work of the Army Commission on Air-Borne Diseases and that of British investigators indicate that tuberculosis institutions should do more to control dust. Sweeping compound liberally applied may keep down floor dust. Perhaps the best available way to prevent dust from bed making is the application of oil to the sheets and blankets.

The gauze mask as a means of protection against fine dust and droplet nuclei is probably useless.

Why have attempts at isolating living tubercle bacilli directly from the air been relatively unsuccessful? We processed more than 5,000 cubic feet of air from the rooms of strongly positive patients without finding the microorganisms. Possibly this is due to such hygienic measures as mouth covering, to the sterilizing action of unfiltered daylight, or to extensive window ventilation. It is probably partly due to inefficient methods for obtaining live bacteria from the air. Another factor is that available techniques for demonstrating live tubercle bacilli are not very efficient. To culture them artificially or in the animal it requires as many days as it does hours for other bacteria. It is necessary to treat the test material with chemicals so as to destroy the other bacteria and prevent their early overgrowth of the culture medium or fatal infection of the test animal. This treatment inevitably kills or weakens some of the tubercle bacilli. The necessary multiple washings and centrifugings also result in losses.

Before generalizing on the possibilities of air-borne infection one must consider the many variables. There are variations in hygiene in different institutions and in home care of patients. Where cold winters require closed windows, the powerfully protective factor of ventilation is lost. There are frequent exceptions to a prevailing so-called good hygiene in the best run sanatoriums. Hygiene will vary with the personnel, and the possibilities of spreading infection will vary tremendously according to the patient. Particularly dangerous are the undiagnosed cases,

the untrained or uncooperative patient, the case with tracheobronchitis, and the terminal case. A patient with a strongly positive direct smear and cough is probably 100 or 1,000 times as dangerous as the one positive only by concentration or culture. Crowded housing and the resultant intimacy account for a good share of the morbidity.

It may be that the majority of infections come from the undiagnosed case or as a result of breaks in hygiene. But student nurse surveys show that new infections continue to occur under presumed good hygienic technique. It seems to me there must be a major means of disease transmission not controlled by present hygiene. This may well be by way of the air, and droplet nuclei and fine dust are likely vehicles. Experience with other air-borne diseases supports this view. We shall not be able to prove it until a more efficient method of isolating tubercle bacilli from the air is developed. Such a method should be capable of sampling the air in a short period of time so that we may determine at what time of day, at what distance from the patient, in what part of the room and during what acts infection takes place.

With accurate information we should be able to devise adequate and efficient methods of prevention.

SUMMARY

1. Dust caught in dishes of saline solution set out at Barlow Sanatorium for one week was examined for tubercle bacilli. There were seven tests in the laboratory and animal house and 19 in hospital rooms. All were negative.

2. In seven attempts to isolate tubercle bacilli from the air by filtration in hospital rooms of the Barlow Sanatorium the results were all negative.

3. In five attempts to isolate tubercle bacilli from the air by means of the atomizer-bubbler device in the hospital rooms of the Barlow Sanatorium the results were all negative.

4. We do not yet understand exactly how tuberculosis is transmitted. The findings for other air-borne diseases indicate that a large share of infection in tuberculosis occurs via the air. We need better methods of isolating tubercle bacilli from the air to prove or disprove this.

A Study of the Relationship of Resistance, Allergy, Anti-Body and Tissue Reactivity In Tuberculosis to the Components of the Tubercle Bacillus*

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TWO years ago I spoke before this Association, attempting to convey in brief fashion the plans which had been formulated for the study of resistance and hypersensitivity in tuberculosis, and to outline our progress at that time.¹ Now I should like to restate our rationale and to close the gap with a summary of our interim findings.

By way of prologue permit me to say that a major goal for those who interest themselves in the basic aspects of infectious disease is this: to correlate the processes which characterize a disease in the infected individual, as revealed by sign, symptom, laboratory tests, and pathological observations, with the activities and constituents of the infecting agent. To piece together this kind of information in anything like a complete form is tantamount to establishing a basic conception of the pathogenesis of the disease in question. It is our overall objective to extend this kind of information with regard to the immunological aspects of tuberculosis.

Despite its chronicity and the relative complexity of the etiological agent, tuberculosis is

one of the infections for which progress along the lines indicated exceeds that of many other of the infectious diseases. Information accumulated from many sources reveals that the impetus for tubercle formation is provided by the phosphatide of the bacillus, and that the wax also has this power in some degree.² These isolated substances may in themselves produce "anatomical tubercle" in normal tissues. The allergic reactivity which characterizes tuberculous infection is related to the protein of the bacterium, although there has been no convincing demonstration that this tissue alteration may be artificially produced with isolated protein. However, the hypersensitivity which whole bacillary bodies, living or dead, incite in the body is easily demonstrated by the local application of the isolated protein to the skin, and this relationship between host response and etiological component is thereby established.

In our attempts to add to knowledge of such relationships, with especial reference to acquired resistance, we had originally devoted most of our efforts to a study of the polysaccharide of the bacillus in relation to immunity. It soon became obvious that the subject could not be approached from too restricted a standpoint and our investigation has broadened to include other concomitant host reactions and other bacillary components.

Briefly outlined, we have tried to relate these

* These studies have been supported since 1943 by grants from the California Tuberculosis and Health Association and the National Tuberculosis Association.

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factors: *on the side of the microbe*, the bacillary polysaccharide, protein, phosphatide, and wax, alone and in combination, as well as bacillary bodies deprived of certain of these constituents*; *on the side of the host* (the guinea pig), the responses of acquired resistance, hypersensitivity, other types of tissue reactivity manifested by skin response, and antibody formation.

The interrelationships between these microbial and host factors now seem to be as follows:

1. *Acquired Resistance.*

Resistance of a significant degree has not been attained in guinea pigs after prolonged courses of injections with polysaccharide, unheated protein, phosphatide, wax, protein combined with phosphatide, bacilli from which lipids have been removed, defatted bacilli to which individual lipids have been readded, or bacilli killed by moderate heat. In contrast, animals simultaneously immunized with attenuated living bacilli have consistently acquired demonstrable resistance to infection. These observations lead us to believe that the substance responsible for the acquisition of immunity is some heat labile factor in the organism, and that in its native form this is not one chemically distinctive substance but rather a complex.

2. *Allergy.*

The hypersensitivity associated with tuberculous infection can be reproduced with dead bacilli, as has been frequently demonstrated in the past. However, bacillary protein alone, in isolated form, is not capable of producing this tissue reactivity. We have observed that after the phosphatide and wax have been removed from bacillary bodies, these lose the ability to induce appreciable hypersensitivity even when injected in large numbers. But when the extracted wax is readded to such bacilli the power to sensitize normal animals to tuberculin is again exhibited. The same is true when isolated protein and wax mixtures are employed for injection. It appears then that the "delayed type" of tuberculin allergy depends upon a response to tuberculoprotein by tissues which are in some way conditioned to the protein by a bacillary lipid, the wax.

It has been striking that the development of hypersensitivity has been repeatedly observed in animals receiving this treatment without the concurrence of any detectable resistance. We believe that this constitutes chemo-immunological evidence, currently undergoing confirmatory experiment, that these two host responses are separable and mutually independent.

3. *Antibody Responses.*

Antibodies have been studied at intervals during the courses of injections of all the preparations mentioned, and during subsequent infection with virulent tubercle bacilli, with emphasis on

the period just prior to test infection, for it is here that animals destined to resist infection should reveal whatever special humoral factors may be important for this purpose.

Antibody to the protein of the bacillus is the most frequently occurring humoral response in animals receiving any type of bacillary vaccine, or the isolated protein alone. This response to protein runs sufficiently parallel with the reactivity of sera to whole bacillary antigens to permit the conclusion that the anti-protein immune body is responsible for serological reactions with the whole bacillus. Nevertheless, there is no correlation whatever between the occurrence of such antibody and the ability of the animal to resist infection.

Less frequently, antibodies have been found directed against the wax of the bacillus, occasionally against the phosphatide, and rarely against the carbohydrate. The occurrences of such antibodies similarly have been unrelated to the state of acquired resistance.

There is therefore no detectable immunological factor in the blood of resistant animals, with respect to the major components of the bacillary cell, which can be regarded as a characteristic of the resistant state. It is perfectly possible that a humoral immunity of some unrevealed kind nevertheless exists.³

4. *Tissue Reactivity.*

As with humoral antibodies, skin test responses have been studied periodically during the periods of vaccination and subsequent infection, but most intensively just prior to the latter. As indicated in the preceding discussion of allergy, skin reactions to protein may occur entirely independently of acquired resistance. Responses to phosphatide have not been found in any significant degree following any type of treatment. Animals which receive bacillary vaccines may develop reactivity of the "immediate type" to the polysaccharide; these reactions, unlike the skin reactions to protein, usually disappear after 24 hours. Although it seems certain that the carbohydrate reactivity is a distinct one in animals subjected to contact with tubercle bacilli, we feel insecure at present regarding its significance. It may appear in animals with or without acquired resistance, but it has in general been more pronounced in the former. More study will be necessary for a fair evaluation of this point.

We are currently engaged in a confirmation and extension of these points, progressively investigating other isolated and combined tubercle bacillary components in relation to host reactions. It is apparent from our present information that the nature of resistance to tuberculosis remains enigmatic. Although it seems to be a property shared by body fluids and tissues,³ we cannot find that it is related to any of the various antibodies produced against the bacterium; nor in the second instance can we relate it in any way to hypersensitivity to tubercle bacillary protein, when this is induced as an isolated phenomenon. A possible correlation with tissue responses to the

* The Cutter Laboratories of Berkeley, California, have generously supplied us with synthetic medium cultures to supplement our own for isolation of bacillary components, and with old Tuberculin in large quantities.

polysaccharide of the bacillus cannot yet be assessed.

Meanwhile, I believe that the study emphasizes the central fact that responses to this single bacterial cell may be dissociated by employing separated bacillary components, and that eventually a clearer conception of the entire immunological picture of tuberculosis may come from such studies.

The documentation and analysis necessary for a complete presentation of these investigations will be reported in a later publication.

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THE ROAD BACK FROM TUBERCULOSIS

A SYMPOSIUM

Four Articles: The Veteran Veterans' Service

The State Plans The Association's Part

THE VETERAN:

JOHN B. BARNWELL, M.D.,* *Washington, D. C.*

THE very title of this symposium "the road back from tuberculosis" is indication of a newer, more modern and more hopeful view of tuberculosis than was commonly held or was even possible at the close of World War I. Then there was little thinking in any quarter on a real "road back from tuberculosis." The very best to be had was a road through the disease or a guide for life with the disease. A number of the able and sincere men who wrote the guides of that day did not themselves take a road back; they did not achieve a complete victory; they accomplished great lives but they lived with tuberculosis and eventually died of it. E. L. Trudeau and his followers thought that was a victory, but it was in reality a compromise, an armistice.

Just as the military and political armistice of 1918 lasted 21 years until 1939, so for many of our veterans has the armistice with tuberculosis persisted to today. Sixty thousand of our tuberculous veterans of that war are still on the pension rolls and 1,000 of them are now in our tuberculosis hospitals. The ideas of compromise with tuberculosis became imbedded among our veteran patients, our doctors, our hospitals and even our Congress. The pension laws are a generous reflection of these ideas which were held widely in the early twenties. To uproot these unproductive ideas and to replace them with the vital concept of victory in complete return to health and productive living is the job of all of us.

In the years intervening between the World Wars the ideas of the danger and cost of an armistice have been supported by experiences and the idea that complete victory is worth the cost, no matter what the cost, is accepted. The cost of complete military victory has been paid in both lives and disabilities. The cost of complete victory over tuberculosis we are now only attempting to measure and to prepare for. On V-J day we were as ill prepared for and as far behind on this humanitarian mission as we were for the military mission presented to us the day after Pearl Harbor.

In July, 1945, we had in Veterans' Hospitals 6,796 patients with tuberculosis. By that time only 2,680,000 had been discharged from World War II. Between then and February, 1946, we acquired 8,000,000 more veterans, each million with its quotient of tuberculosis. At one time the Army discharges contained seven cases of tuberculosis in each 10,000. From all the services our figures now approximate one case of tuberculosis for each 1,000 discharges. From the 8,000,000 veterans then, we would have acquired 8,000 new cases of tuberculosis between July and February, more than doubling the load we carried in July. By January we had placed 2,000 of these in Veterans' Hospitals by additions and in emergency beds—3,000 are being held in Army Hospitals and 3,500 in Navy Hospitals; others are in contract civilian hospitals. The total load is not overwhelming for the nation as a whole but it is the rapidity of the accumulation on one agency that is staggering. Not only does it take time to build hospitals but it takes time to recruit an adequate staff. Recruitment of tuberculosis specialists is heartening in the very high grade doctors who are joining us but it is not keeping up with the accumulation of new patients.

* From the Tuberculosis Division, Veterans' Administration, Washington, D. C. Read before the California Tuberculosis and Health Association, San Francisco, April 24, 1946.

Obviously our first cushion for such a load is in the contract civilian hospitals. We are sure we know how to control the abuses that arose in contract hospitals after the first World War. Our second cushion should be sections of not less than 100 beds in the Army general hospitals which are being taken over. It is hoped that this policy of tuberculosis services can be extended to other general hospitals to be built. These services would be complete and isolated but patients would remain in them only so long as they required bed rest. Similar tuberculosis units are planned for neuropsychiatric hospitals.

The rural type sanatorium would be continued for those who needed out-door exercise. Two additional types of institutions are proposed for those who have received "Maximum Hospital Benefit." One is for the so-called "good chronic" who has positive sputum but for whom definitive treatment is inadvisable. Such an institution should be so located that it takes advantage of any national reputation as a "health resort" so that these unfortunates will be more willing to accept isolation. The other type is the "community for the severely handicapped" being developed by our Medical Rehabilitation Service under Dr. Donald Covalt. To these will be admitted only those with negative cultures but who have emphysema or are otherwise disabled. Both groups will need the most expert services and most sympathetic handling. I am searching now for the unusually gifted and talented personnel that will be needed in such institutions.

The present need for the last two types of institutions is an admission of past and present compromises and defeats. It is to be hoped that early diagnosis followed by treatment that is sufficiently intense and prolonged in the acute general hospital and the convalescent rural hospital will result in completed cases and reduce both the readmission and the maximum hospital benefit case.

Early diagnosis among the veteran is to be affected by routine x-ray examination of all admissions to all veterans hospitals and reexamination at yearly intervals of all chronic cases. All out-patients will be x-rayed on each visit for any purpose unless such an examination has been made within the past six months. Every discharged tuberculous veteran is to be followed at three-month intervals by the nearest veteran agency or by designated physician when such is needed to save transportation for the service connected case. Photo-fluorograph units are to be installed in all offices taking more than 500 x-rays a month.

The nursing technique is under the able and courageous direction of Miss Etta McNett who pioneered asepsis in the tuberculosis pavilion of the Cleveland City Hospital. The rehabilitation service is the most ambitious ever undertaken for the tuberculous. It includes physical medicine, physical therapy, corrective physical rehabilitation, prevocational shop retraining, educational retraining, and in the words of Dr. Covalt, the

director, "all designed to aid and motivate the patient to early recovery and purposeful living."

For the first time in history an agency is given the opportunity to do for the tuberculous what we in civilian life have always hoped for. We do not, however, look upon this as merely a veteran problem. It is a national problem and we have only our share of it. Through monthly meetings in Washington, the V.A., the Army, the Navy and the Public Health Service, are attempting to coordinate our work to the end that the National goal of control of tuberculosis may be attained. Colonel Long who had charge of the tuberculosis program for the Army developed the office which I now occupy. He remains the consultant to the V.A. and to the Army. As a result of his work both the Army and the Navy are now holding their cases until the V.A. can be prepared. Dr. Hilleboe of the Public Health Service, first to remind me of the continuing national importance of our work, has had statistics prepared to project our load into the future if the national rate does not decline. In the latter event his figures show that the maximum number of new cases per year will develop until 1975 when the average veteran will be 55 years old, and that of the 9,366,000 veterans then alive, 14,000 will have tuberculosis. He goes on to remind the children and grandchildren of this audience that in the year 2,000, among the octogenarian veteran there will be 2,400 senile cases of tuberculosis. The control of tuberculosis in the veteran is truly the nation's problem and the control of tuberculosis in the nation is just as truly a veteran problem.

A great deal has been said and written about the danger of the tuberculous veteran spreading tuberculosis among the non-veteran civilians. Very little has been said about the danger of the discharged veteran contracting tuberculosis when he returns to his community. Yet, 99 out of every 1,000 veterans are known to have had negative x-rays and this cannot be said of any other so large a group of our citizens. With our case-finding and follow-up we propose to keep this ratio at least this favorable. It will be an effective control program from the national point of view only in those communities that have a like program.

The medical organization to carry out this program centers in Washington under Dr. Hawley, but its operational functions have been rapidly decentralized to the Branch Area of which there are 13 in the country. Each specialty of medicine is represented in each area and in tuberculosis we have been most fortunate in the distinguished group of physicians who are adding to an already busy life the duties of Chief of the Tuberculosis Division for these areas. Almost without question these men stepped forward when called upon. In your area we have our able chairman, Dr. Chesley Bush.

I am proud to work under the leadership we now have and I am proud to work with the teams that have come with us and with the teams that have stayed with us. There is a fine meshing of

the old and the new members of the staff in the central office. The old are working with the zeal of men long denied the tools they needed for the job and the new with the fire of a convert. This team work must go throughout the hospitals. This team will not permit failure, but no man on this team underestimates the problem. No man among them is afraid to acknowledge the size of the task. We all ask your help, for none think we can accomplish the task without more help.

THE STATE PLANS*:

HARRY D. HICKER, *Sacramento*

At the last annual meeting of the Association I had the privilege of describing the services offered by the California State Bureau of Vocational Rehabilitation to physically disabled residents. I outlined our program as consisting primarily of counseling or guidance, vocational training and placement, with auxiliary services of provision of artificial appliances and transportation. I indicated how our program had benefited hundreds of tuberculosis ex-patients in their vocational adjustment.

Since that time something has been added; in fact, a great deal has been added. Amendments to the Federal Vocational Rehabilitation Act accepted by the state now provide for service to the mentally handicapped as well as to the physically handicapped. Provision may now be made for corrective surgery and other therapeutic treatment to improve the physical condition of the client. This provision includes psychiatric treatment in cases of mental disability. Maintenance may now be provided during the period of training. Placement equipment may also be provided to assist a person to establish himself in business. In short, vocational rehabilitation is now legally defined as "any service needed to render a disabled person fit for remunerative employment."

Previously our service had been restricted by limitations of financial support and consequently of personnel. At the last session of the State Legislature the annual state appropriation was increased to \$300,000. Not only is this amount matched by Federal funds, but in addition, the Federal Government now provides the total amount necessary for administration and for guidance and placement costs. In effect, approximately two federal dollars are now available for each state dollar, thus making available a total of nearly \$1,000,000 per year for Vocational Rehabilitation service.

What do these changes mean with reference to the field of tuberculosis? They mean, for one thing, that we are now in a position to provide service in greater degree to ex-patients. Our staff has doubled during the past three years and we

are planning next year on adding 44 additional professional personnel. This will give us a total of 130 professional workers.

An agreement has been entered into between the U. S. Office of Vocational Rehabilitation and the National Tuberculosis Association for the promotion of in-sanatoria training centers. We are planning to implement this agreement on the state level in cooperation with the state and local associations. We have already assigned one Rehabilitation Officer full-time in Southern California to work with sanatoria on arrangements for referral of cases and other coordinated services. We are planning to make a similar arrangement in Northern California.

On the basis of official records California has for a number of years past led all the other states in providing vocational rehabilitation service to tuberculosis ex-patients. Without going into further detail, it is obvious that with the increased facilities at our disposal, we are now in a position to render even greater service, and with your cooperation and assistance it will be our endeavor to do so.

There is no longer any reason why every ex-patient may not be provided any assistance he may need on his road back to a place of economic independence in the community as a productive and self-sustaining citizen.

VETERAN SERVICES*:

EDWARD DUNNER, *Major, Army Medical Corps*

Under the new set-up of the Veteran's Administration hospitals, comprising an exceptionally well trained staff of physicians, experienced nurses and outstanding consultants in specialized fields, the veteran today is receiving the best medical care that it has been the privilege of the people of our country to afford.

The "road back" from sickness to health has also been made easier for the disabled veteran through the various agencies connected with the hospital which are ready to serve from the moment he is hospitalized until he becomes fully rehabilitated.

A new procedure put into effect by the present administrator is the so-called follow-up system. This set up is now in full swing.

Our responsibility for the care of any tuberculous patient does not terminate when the patient is discharged from the hospital. All patients will require further examinations; some further treatment and others rehabilitation before resuming normal activities.

Under the present policy, veterans discharged from a hospital are recalled for examination to determine the progress of the disease. Transportation is generally furnished and the veteran is handled in the out-patient department in many

* From the California State Department of Education, Bureau of Vocational Rehabilitation, Sacramento. Read before the California Tuberculosis and Health Association, San Francisco, April 24, 1946.

* From the Department of Medical Services, Veterans' Administration, San Francisco. Read before the California Tuberculosis and Health Association, San Francisco, April 24, 1946.

instances without the necessity of admission to the hospital. In cases where for geographical reasons it is not practicable to report to the discharging hospital, it is the responsibility of the discharging hospital to make the necessary arrangements with the V.A. hospital or regional office nearest to the patient's home that is equipped to render such follow-up care.

Whenever possible, arrangements are made prior to the patient's discharge advising him which hospital will conduct his future examinations and the approximate date on which he should report for the first time. In the event of an irregular discharge which precludes completion of prior arrangements, the veteran is notified by letter of the subsequent arrangements made for his follow-up. Reports are sent to the local or state health authorities advising as to the diagnosis, sputum findings, treatment received and the examinations and treatment that appear indicated. Within a period of 30 days, the discharging hospital ascertains from the local or state health authorities whether subsequent contact has been made with the patient by that agency.

Every patient with active tuberculosis is urged and encouraged to accept hospitalization so that constant observation and supervision may be provided for him. In those cases where hospitalization is refused, the place where the future examinations are to be made and the interval between examinations are determined to a large extent by the patient's physical condition and the distance from his home to the hospital. In those cases where the patient's physical condition may be harmed by traveling every effort is made to have the examination conducted at government expense in the patient's local community, if the proper facilities are available. When proper facilities are not available, managers may assign tuberculosis specialists to conduct the required examinations in the local community at the indicated intervals.

Briefly, the examinations recommended as minimum requirements for good follow-up care are as follows:

1. Cases of active tuberculosis with positive sputums shall have an x-ray and a physical examination at least every three months, and a 24-hour concentrated sputum specimen examined every month. (This may be mailed to the lab.)

2. Cases of active tuberculosis with negative sputum for a period of three months or more, shall have an x-ray and a physical examination at least every three months, and a 72-hour concentrated sputum specimen examined every month, and if the smear of the concentrate is negative for A.F.B. a culture will be made.

3. Cases of quiescent and apparently arrested tuberculosis shall have an x-ray and physical examination every three months. If the smear of the concentrate is negative for A.F.B., then cultures should be made.

4. Cases of arrested tuberculosis shall have an x-ray and physical examination every six months.

The apparently cured patient shall continue these examinations at 12-month intervals, indefinitely. The sputum examination will be made as indicated. Arrested cases report at six-month intervals and after two years of normal activity will be classified as apparently cured.

Patients receiving collapse therapy have x-ray films of the chest made at intervals not more than three months apart, preferably two or at any time that it may be medically indicated. Just prior to discharge from the hospital every collapse case is reviewed by the therapy board which estimates the minimum period of time required for continuing collapse therapy. The recommended period of time is given in writing to the patient upon his discharge and in addition a report is forwarded to the hospital or physician with whom treatment is to be continued.

By establishing a well outlined program for follow-up care it has already been possible to reduce the number of irregular discharges.

Measures directed at keeping the patient content include a full recreation program with a 16 mm. portable sound film for the infirmary wards, band concerts, three motion pictures a week, USO shows, bingo and card parties. Plans also are in progress for a nonsectarian chapel to be erected on the hospital grounds to supply the spiritual needs of the patients. A full time social worker is available. He makes referrals to public welfare agencies in cases where there is an immediate financial problem. In cases where a veteran's wife is unable to take care of minor children because of having to go out and work, Social Service helps solve this problem by referral of cases to public or private social welfare agencies.

The various service organizations are quite active and contribute immeasurably in making the patients content.

The library is well equipped and subscribes regularly to approximately 160 standard magazines.

A full time contact representative files all claims for pension and gives information relative to the rights and benefits pertaining to the G.I. bill of rights and information on Public Law 16 for veterans with compensable disabilities. Not only are patients in the hospital benefited by the Contact Office but also veterans in the community who have returned from the service have ready access to his office.

Moreover, one of the most important new innovations in Tb. Veterans' Hospitals is that of rehabilitation and vocational guidance. The Livermore Veterans' Hospital has been one of the first hospitals to incorporate a full program of vocational guidance for its patients. Under the supervision of Mr. Arndt who was trained in New York City at the Institute for Crippled and Disabled patients each patient is given a series of interviews at which time his vocational and educational background are rechecked and an attempt made to start him on his future vocation while he is still in the hospital.

Various tests which are given include:

The Kuder's Preference Record: This gives the examiner an indication of job preference.

Otis Mental Ability Tests: This test which contains 80 questions to be answered in 30 minutes gives an indication as to the patient's I.Q.

Ohio State Psychological Exam: Gives an indication as to whether the patient is college material or not.

Other tests are given to determine how well a patient can think mechanically, how well he can put things together, etc.

With the information thus obtained, the patient is advised as to the possibilities for pursuing a certain field and pre-vocational training is immediately started. Of course, the approval of the medical officer is obtained prior to initiating this training. Each patient is reviewed by members of the following group:

1. Vocational advisor, who suggests the vocation to be followed.

2. Occupational therapist, who handles his pre-vocational training.

3. Chief of physical medicine, who takes care of those diseases or disabilities which would be benefited by physical therapy.

4. Medical officer who advises as to the number of hours to be spent on vocational training.

5. Social service worker who furnishes the social background of the patient.

A strong effort is being made to get away from the old idea of relegating recovered patients to the field of elevator operators and guards or watchmen. There are many vocations to which they may turn, varying from that of determining the value of jewelry to pursuing a Ph.D. degree. I mention the Ph.D. as we have recently had one of our patients complete his thesis for this degree while hospitalized. He has been followed up as an out-patient and adjudged ready to accept an instructorship at a university.

In conclusion, I would like to emphasize that the "Road Back From Tuberculosis" is being paved and converted into a modern 4-lane highway (beset with hazards, as many California highways are today), but also equipped with enough green and red stop lights to aid the traveler reach his destination and return safely home with a feeling of optimism toward the future.

THE ASSOCIATION'S PART

MRS. HOWARD E. SKINNER, *Ventura*

In the past when rehabilitation has been discussed at meetings such as this, we have heard the suggestions for programs and said of them, "They make a pretty picture—in fact, a beautiful picture—," and then we have just hung them on the wall and let them stay there.

For rehabilitation is a big job, one which calls for cooperation between many agencies and for planning on the large scale which we have heard described. Most tuberculosis associations are limited in personnel and funds. We are always having to choose certain activities on which we will concentrate, and some important things are left undone.

We know that if we find tuberculosis in its early stages there is a relatively rapid and complete recovery in most cases. If all tuberculosis were found early there would be little need for a rehabilitation program. So, the first responsibility of a tuberculosis association is to do all it can to forward the finding of early tuberculosis. In other words, if we do not have funds and personnel enough for both, we must first continue to conduct and emphasize the mass survey programs which are being developed.

There is a second thing which we can do which might at first glance seem unrelated to the subject. We have heard emphasized the need for strengthening our official health agencies and the need for all agencies to work together to solve problems related to tuberculosis control. We must do everything in our power to strengthen the official agencies in our community.

But there are still some things which we can do to further a rehabilitation program in our own communities. We can inquire into what the program is in our community; clarify and set a goal that is within reach and then set others to thinking. It has sometimes seemed to me that the tuberculosis association can act as a catalyst in a community program, that its presence can assist in bringing certain things about which need to be done, without itself devoting much in the way of funds and time.

The adult education director working in our sanatorium asked me before I came up here what I was planning to say. In answer to my replies she said, "I wish I could speak for you, for your association is of great importance. Tell them for me, that the tuberculosis associations can give moral support to the program that is beyond value to those who are working in the field."

What are the questions which one should ask?

Inquire into what your clinic set-up is, is it hospitable to patients, do they want to come back? How well do the public health nurses make their home visits? Where does teaching for rehabilitation begin? We have been told that it begins with the first contacts of nurse, clinic and sanatorium with the patient. Know whether or not your sanatorium is a "place of oppression" or "a welcome place for the reconstruction of the bodies and of the well-being of the mind of the patient."

What kind of problems in rehabilitation exist as indicated by the makeup of the Sanatorium patients as to age groups, nationality groups, languages and whether or not the majority of patients are old chronics or minimal cases.

Is there a medical social worker, and if there is, is she really aiding rehabilitation or is she there merely to determine the financial eligibility of the patient? What of the welfare policies in

* From the Ventura County Tuberculosis and Health Association, Ventura. Read before the California Tuberculosis and Health Association, San Francisco, April 24, 1946.

your community in regard to the "means" test? If it is poor is it the reflection of the social workers themselves, or of the supervisors who provide funds? Who in your community needs education about these policies? Where can you educate?

In the sanatorium, do they use modern vocational aptitude testing techniques? Is there an education program available to the patients? In our community there is a fine tie-up between the sanatorium and the Board of Education which provides teachers for those who wish to complete or enlarge their education. Only recently they

have employed additional part-time teachers for special subjects for an hour or two a week.

You might be interested to know that the Department of Industrial Welfare has recently changed a ruling so that it is now possible for patients to work at the sanatorium on jewelry and other small articles in a business-like way, which thus provides for the patient's self-respect and develops skills which carry over and may lead to employment after discharge. The patient must be helped to know that there is still a future for him.

DISABILITY PAYMENTS

RESOLUTION: In Re Veterans Leaving Hospitals*

WHEREAS, a large proportion of tuberculous patients in United States Veterans' hospitals leave these institutions against medical advice and before their disease has been brought under control, and

WHEREAS, such conduct not only defeats the patients opportunity of arresting the disease and becoming a useful, self-supporting citizen, but because of the communicable nature of tuberculosis, endangers the health and lives of his family and the public with whom he comes in contact, and

WHEREAS, one of the major reasons for such conduct is that the payment to the veterans for disability is less while he is in the hospital than when he is outside, therefore

Be It Resolved, that the delegates of the California Tuberculosis and Health Association in meeting assembled, go on record as favoring the adjustment of these disability payments so that the veteran is not penalized by being a hospital patient.

* Read before and adopted by the California Trudeau Society and the California Tuberculosis and Health Association, San Francisco, April 23, 1946.

Chemotherapy of Tuberculosis*

B. L. FREEDLANDER, M.D., *San Francisco*

IN the search for new chemotherapeutic agents one does not proceed entirely by the empirical method, in which all types of chemicals are tested. There are many factors in the evaluation of new chemicals, which determine in advance whether a compound is worthy of further investigation. These include the following:

1. Toxicity. Highly toxic substances and protoplasmic poisons are ruled out.

2. Absorption. Insoluble compounds are unlikely to be absorbed; the compound must be soluble in either water or lipids.

3. Transport. After absorption the chemical must be carried by the blood and remain relatively unchanged until it reaches the focus of infection. A large number of compounds are changed or destroyed as they pass through the liver.

4. Cell Penetration. The penetration of the bacterial cell by a compound may depend upon:

(a) the hydrogen ion concentration of the cell and the surrounding medium;

(b) the degree of ionization of the compound;

(c) the water-lipid solubility ratio. The cell surface of the tubercle bacillus is highly resistant to inorganic acids, as well as to compounds, in general, in a highly ionized state. On the other hand, there is reason to believe that the intracellular susceptible enzyme system is more affected by compounds in the ionized state. It is asking much of a new therapeutic agent, to have it remain un-ionized until it passes the cell surface, and then have it become ionized.

There are three further rigorous screening tests, which a new therapeutic agent must pass, in order to be effective. They are as follows:

1. High bacteriostatic effect in vitro, in the presence of serum.

2. The concentration of the compound which is bacteriostatic should be less than the concentration which injures leukocytes.

3. The chronic toxicity of the compound in animals must not be too high. Of the thousands of surface germicides, which have been reported, there are not ten which are less toxic to the host than to the parasite. Florey has postulated that

* From the Harold Brunn Research Institute, Mt. Zion Hospital, San Francisco. Synopsis of a paper read before the California Trudeau Society and the California Tuberculosis and Health Association, San Francisco, April 24, 1946.

the beneficial effects of penicillin depend on the simultaneous action of the leukocytes and other defense mechanisms, which deal with the bacteria, while multiplication is held in check by the penicillin. In the therapeutic evaluation of new chemicals, there is a prevalent illogical tendency to push the dosage to tolerance, without consideration of the toxic effects of these drugs on other defense mechanisms.

We have synthesized various new derivatives of diphenyl-sulfones, sulfoxides and sulfides; and have tested their effects in-vitro and in-vivo.

Sulfones: 2,4'-diaminodiphenyl sulfone; 2,2'-diaminodiphenyl-sulfone; 4-benzylidineamino 4'-aminodiphenylsulfone; 4-nitro 4'-acetylaminodiphenylsulfone; 4-iodo-4'-aminodiphenylsulfone.

Sulfoxides: 4,4'-diaminodiphenyl sulfoxide; 4,4'-diacetylaminodiphenyl sulfoxide; 4-nitro 4'-aminodiphenyl sulfoxide; 4-iodo 4'-aminodiphenyl sulfoxide.

Sulfides: 4 chloro 4'-aminodiphenyl sulfide (also acetylated); 4-iodo 4'-aminodiphenyl sulfide.

The 2,2' and the 2,4' diaminodiphenyl sulfones were less bacteriostatic than the corresponding 4,4' derivative. The diaminodiphenyl sulfoxides show approximately the same inhibitory effects in-vitro and in-vivo, as the corresponding sulfones. The 4-benzylidineamino 4'-aminodiphenyl sulfone shows the same therapeutic effect in animals as the parent compound; it probably hydrolyzes to diaminodiphenyl sulfone in the body. The halogenated sulfides inhibited the growth of tubercle bacilli in-vitro in very high dilution (1-800,000); however, they were highly toxic and showed no therapeutic effect in-vivo. The sulfoxides, like the sulfones, were antagonized by p-amino benzoic acid; the halogenated derivatives were not.

Health Education and the Democratic Process*

CLAIR E. TURNER, ED.M., DR.P.H., *Berkeley*

IN the United States, more than anywhere else, voluntary health agencies and voluntary efforts on the part of the people have contributed to the public health. Health education has gained increasing recognition as a tool in health promotion. Today, community organizations for the study and solving of health problems are gaining recognition as the basis of a desirable health education program. A glance at the development of health education will show how both school health education and public health education have led us in this direction.

School health education began with the teaching of health facts, apparently with the assumption that adequate knowledge would produce healthful living, and without recognition of the fact that to do is not as easy as to know what is good to do. There was little recognition of the part which emotions and attitudes play in formulating behavior. The folly of the philosophy of those days reminds one of the young scientist who applied scientific principles to matrimony. He made a long list of the qualities he desired in his future wife. Actually, he found a girl who possessed all of these qualities, but he did not seek her hand in marriage. The only reason he could give was that he didn't like her.

In those days, what we did at school drowned out what we said. In the hygiene class, we taught that hands should be washed after going to the toilet and before eating; but at school we provided no place for washing the hands. We tried to teach the value of medical supervision by tell-

ing children that physicians were scientific, friendly, thorough men and women. But the towns purchased so little medical time that the physicians seemed to children to be hurried, brusque, and superficial.

We tried to educate the home through the school until we found that a contradiction between health practices in the home and at school got us nowhere with the child, and that home and school must team up together if health education is to be effective.

The school observed that the community had not solved its health problems, but the school often acted as though it were not a part of the community, and blamed the government for the neglect of its citizens.

Gradually, we have improved school health education by changing our emphasis to the improvement of health behavior, by giving greater attention to healthful school living, by strengthening home and school relationships in the joint program of child training, and by relating school health education more closely to community-wide efforts for health improvement.

Schools now have carefully planned programs of health education which provide sound, graded instruction at different age levels, but which also give careful attention to indirect learnings which may be provided outside the hygiene class, and the schools of today are much more willing to depart from a fixed schedule to participate with the rest of the community in the solution of some particular community health problem.

Health education in health departments and in other health agencies has undergone an evolution pointing in the same direction. The early days may be described as the "publicity era." Publicity was the primary activity, and the program

* From the Department of Health Education, School of Public Health, University of California, Berkeley. Read before the California Tuberculosis and Health Association, San Francisco, April 24, 1946.

was measured in terms of the number of pamphlets produced, or the number of column inches in the press. One might as well try to estimate the speed of an animal by the number of legs he has. It is not possible to evangelize the world merely by printing Bibles. Publicity is one of the useful tools of the modern health educator, but we have gradually learned that education is measured by what is learned, not by how much is taught.

A little later we came to recognize the importance of the campaign. Perhaps our colleagues in the field of social work helped us in this respect. At least, those who took part in the campaign learned something about the problem, but too often the campaigns were the bombardment of a passive and inactive public by a group of experts, instead of a plan to mobilize the active interest and participation of the people themselves.

Today, with a sounder educational psychology, we have come to emphasize the organization of the community to study its own problems and, with the aid of official and voluntary health agencies, seek a solution. It recognizes that there are many leaders, recognized and potential, in our modern communities. It recognizes that the work week is short and growing shorter, that life is more enjoyable when one is contributing to social progress, and that community organization for health is satisfying as well as life-saving. It takes the attitude that health education in the community, as well as in the school, is an active problem-solving process. The public school might be defined as an agency for guiding the interest and energy of children into useful learning experiences. In school or community, "educate" is always a reflexive verb. We can no more educate a person than we can grow him. He must grow himself, and he must educate himself. In community organization, the health agency does not do things to people; it helps people to organize, to study problems, and to do things for themselves.

Community organization may be more clearly described by listing the important steps in a single project in the experience of one of our larger cities. A health educator, in this case a young woman well-trained in education and in public health, was employed by the health department and assigned to a district of about fifty thousand people. She proceeded to form a health council. First, she went to each of the physicians within the district, and the physicians met for the first time in some fifteen years, naming, at this meeting, a committee to cooperate with the project. Other community leaders were approached, including dentists, nurses, clergymen, priests, settlement-house workers, and educators. The interest of service clubs and social clubs was secured.

A health council was formed, including a member from each of the groups above mentioned, and the meetings were held at the health center. The council studied various health problems, and decided to make its first venture in the field of rat control. The health council studied the rat problem intensively with the help of literature and speakers, and they investigated the visual material

and other resources for educating the people of the district on this topic. A public meeting and exhibit were arranged.

The council decided that a rat survey was needed and appealed to the health department for assistance. Members of the council visited the homes in advance of the sanitary inspector, and explained that the survey was being made at the request of the community. The survey of many hundreds of homes showed that a few common procedures in rat-proofing were widely needed and informed each householder of his particular problems.

The secondary schools in the district had a unit on rodent control at the same time the adults in the community were studying the problem. The manual training department developed a unit to teach teen-age boys, in both public and parochial schools, how to carry out the commonly needed rat-proofing procedures.

Publicity was carried out through printed matter, press, films, speakers, and in other ways. Subsequent meetings were held at which landlords, including banks, and house owners were present. Rat-proofing procedures and costs were discussed. The whole community gained a more intelligent interest in the problem, developed a closer cooperation with the health department, and secured better rodent control than at any time in its previous history.

Community organization for health is educationally sound and it strengthens democracy. These two values are so great that health education in the future may very likely center about this activity.

It is educationally sound because it emphasizes learning, not teaching, because it mobilizes the interest and energy of the people concerned, because it uses the problem-solving approach, and because it squares acts with facts.

There are three important ways in which this American type of procedure strengthens democracy. In the first place, it establishes the proper relation between the people and the government. Government is, or should be, an agency of the people, created by the people, to do those things for the people which they cannot do for themselves. Too often we think of government as remote from the people, and as something which should do everything for us. We criticize it as though it were king-made, and we were still a colony. We study it critically, and we find something wrong which only confirms our original belief that government is bad. We have been drifting farther away from government since town-meeting days.

We used to be told that we must work for a living. Sometimes we meet people now who seem to think all they need to do is vote for it. It is still true that whatever man has, must be produced. But we lost our economic compass when we moved from the farm to the production line. On the farm we saw that hard work is always necessary to produce wealth. Sometimes there is failure even when one does work hard. The hired

man had at least some idea of what he was worth to his employer in dollars and cents. Millions of men today have no possible way of knowing how much they individually are worth to the industry. They are equally baffled in knowing how much government can do for the individual citizen. Government cannot be Hygeia, or Midas, or Santa Claus. Let us hope that government does not become, as it has in some countries, a military occupation, swapping food and shelter for individual freedom.

An improved relationship between the people and the health department is reflected in the rat-control project described above. The people sought to solve their own problem, but found it necessary to turn to the health department for help. They received this help and appreciated it. They found that the health department was ready to do all it could for the citizens, within its budget, and they were ready to help the health department to strengthen its budget for really needed activities. This is a much better relationship than one in which the health department is a policing agency and a resentful public complains when the inspector comes to them as a law-enforcement officer in order to carry out rat control.

A second value of community organization for health lies in the provision for co-ordinating the activities of many health agencies. We have many voluntary health agencies. The recent report by Gunn and Platt presents a clear statement of their usefulness and their problems. It makes a strong plea for closer coordination. Any community is fortunate to have the assistance of the voluntary health agencies which they discuss, but it is possible for too many health programs to be promoted at the same time in the same community. Whatever can be done to strengthen the interrelationships between these organizations at

the national level, it is certain that coordinated effort at the grass-roots level in the local community is highly desirable. This coordination can be secured both through the combining of separate health agencies and through the organization of the community with its own health council, which can receive assistance from the various existing health associations. A community well-organized and actively at work in solving one health problem after another is a more encouraging sight than a passive community besieged by many though meritorious health agencies.

Perhaps not least important in strengthening democracy is the effect of community organization upon the attitude of youth. Earlier in this paper we referred to the school situation in which older pupils observed that the community failed to carry out needed health activities. Young people with this experience will approach problems in later life with a discouraged attitude. They will say, "Oh yes, we were taught in school that rats present a health problem, but nobody ever did anything effective about it. You can complain to the health department, but you can't expect much from government." Young people who have participated with the rest of the community in solving some of these health problems will take a different attitude. They will say, "We don't have to stand for a rat nuisance. We can solve that problem with the help of government." This is a democracy.

We have had enough experience in the last few years to show that communities are ready and glad to attack their health problems. Wherever groups have gone to work under constructive leadership and sympathetic relationships with health departments and voluntary health agencies, they have improved the public health and strengthened democratic government.

NTA ANNUAL MEETING IN SAN FRANCISCO NEXT YEAR

Word that the National Tuberculosis Association will hold its forty-third annual meeting in San Francisco, June 16-19, 1947, has been received from Dr. Kendall Emerson, managing director.

The Fairmont Hotel, scene of the 1946 annual meeting of the California Tuberculosis and Health Association, will be the headquarters of the meeting. Dr. William P. Shepard, San Francisco, a past president of the state association and president of the NTA, will preside. The NTA has not met in California since 1938 when the annual meeting was held in Los Angeles.

Although the program committees of the California Tuberculosis and Health Association, the California Trudeau Society and the California Conference of Tuberculosis Secretaries have not met, it is likely that they will decide to hold business and delegate meetings on the day preceding or the day following the NTA meeting and that clinical and administrative sessions will not be scheduled. The corresponding national organizations will present complete programs.—*News Letter*, California Tuberculosis and Health Association.

TUBERCULOSIS DEATH RATE DECREASES

The final death rate from tuberculosis for 1944 in the country as a whole was 41.3 per 100,000 population, according to figures released by the U. S. Bureau of the Census. This 1944 death rate represents a decline of 3.1 per cent when compared with the 1943 rate of 42.6.

Deaths from tuberculosis in the United States numbered 54,731 in 1944, compared with 57,005 in 1943 and 57,690 in 1942. Tuberculosis mortality decreased in 31 states and the District of Columbia in 1944, and in seven of these states the decline was more than 10 per cent when compared with 1943. These states were North Dakota, New Hampshire, Nevada, Georgia, Iowa, Montana and Virginia.

In 16 states the 1944 death rates increased, and the advance was marked in Arizona and Oregon. The tuberculosis death rate in Arizona increased 25.2 per cent over 1943 and in Oregon the increase was 15.5 per cent. In Alabama, the death rate was the same in 1943 and 1944.—*News Letter*, California Tuberculosis and Health Association.

Social and Economic Hindrances to Program For Prevention of Tuberculosis*

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PROGRESS in the prevention of tuberculosis is rather seriously impeded by two deviations from the long standing, widely accepted principle that tuberculosis is a communicable disease, dangerous to the public health, and so should be dealt with as a public health problem of the first magnitude.

The first handicap is the policy of requiring tuberculosis patients or their legally responsible relatives to pay for their isolation and treatment in public tuberculosis hospitals—a service that is primarily intended for the protection of the family and the community from the spread of infection from the patient to the members of his household and others. Tuberculosis is a costly communicable disease. Hospital care takes months, sometimes years. The vast majority of families are unable to pay for the long drawn out course of treatment.

This financial policy has the effect of delaying and often of defeating the segregation of infectious patients in tuberculosis hospitals and therefore permits the spread of the disease in the homes and elsewhere; it delays the admission of patients to hospitals early in their disease, when the chance of recovery is much greater; it is a detriment to the cure of those patients who go to the hospitals because of their worry over family finances. Furthermore, it deters numerous patients from entering hospitals because they hear that other patients have had to sacrifice their meager savings and other modest assets in payments for hospital care. The group in our population that is most disastrously affected by this short-sighted policy is the hard-working, thrifty, self-supporting class who manage their affairs with reasonable competence but who cannot stand up against the economic catastrophe that tuberculosis usually brings to family life and independence.

For most families, their chief and sometimes only asset is their work capacity. Losing it spells disaster for such families. We tell the tuberculosis victim that he should stop work and obtain treatment but if he is the husband and father, who will provide food, shelter and clothing for the family? If wife and mother, who will manage the home and take care of the children?

When, besides being beset with these very crucial problems, he is told that hospital care must be paid for in full or in part, the patient realizes at once that the family savings would thus be sacrificed. So, all too often, the sick person de-

cides not to go to a hospital or if he does go he does not stay long enough and back home he comes to take a chance that somehow, someway he can get along without hospital care. What it really comes down to is that he decides to take a chance on beating the undertaker! Usually the patient gets worse and loses that precious possibility of early recovery. Then, sooner or later, he has to stop work because he is physically unable to carry on any longer. He becomes destitute and finally accepts hospitalization, often for the rest of his life and he also accepts charitable relief now for the family. Meanwhile, it is usually the case that one or more other persons in the family have become infected.

The savings that actually accrue to the taxpayers through the enforcement of the "means test" are usually less than 5 per cent of what it costs to run the hospitals. There have been two instances in New York and Michigan where counties employed special workers to investigate the financial circumstances of patients seeking admission to or already in tuberculosis hospitals and to enforce collection from those thought to be able to pay something for their care. In each instance the cost of that investigator's position in terms of salary and travel was less than what he collected from the patients or their families.

The amounts collected from patients through enforcing the so-called "means test" are trifling sums compared with the losses sustained by the community and Society as a whole because of the many untimely, preventable deaths and the long periods of incapacity for work, the loss of income for family support, the cost of funerals, the expense of caring for dependent, bereaved families and of caring for the additional cases who were infected by the original patients who would not go to hospitals or stay there long enough, largely because of the "means test." All this is due to failure to be logical and sensible in the application all along the line of the governmentally declared public policy that tuberculosis is a communicable disease, dangerous to the public health, and so should be dealt with on a public health basis and not on a public charity basis.

The remedy for overcoming this handicap is to do away with it: that is, to repeal from existing legislation the so-called "means test" and to provide instead that hospital isolation and treatment shall be provided free of charge to the patients, and to permit patients who offer to pay for their care to do so. Illinois provides free hospital care for its tuberculosis patients; the State of New York has just decided to do so; and Wisconsin, Michigan and Kansas substantially repealed the "means test" from their statutes last

* From the New York State Committee on Tuberculosis and Public Health, New York, N. Y. Read before the California Tuberculosis and Health Association, San Francisco, April 24, 1946.

year. All other states would do well to take similar action.

The other hindrance to the preventive program is also socio-economic in character. It relates to the extent, type and quality of assistance that is provided for families which tuberculosis impoverishes because of the reduction in or loss of family income which the disease causes. Here too our objective should be the prevention of the spread of infection from the patient to the exposed members of the family as well as the care and cure of the patient himself.

Often the tuberculous father and breadwinner of the family or the tuberculous mother and caretaker of the children refuses to accept hospital segregation and treatment, or to continue it long enough if once accepted, because of the failure of the authorities and agencies concerned to help the family to provide adequately for the maintenance of an appropriate standard of living.

A clear distinction needs to be made between the kind of public assistance given to tuberculous families and that which is given generally to the

poor. What is needed is not bare maintenance on a minimum or on an average relief standard. To achieve prevention of the spread of infection, it is often necessary to raise such families to a higher level.

Competent social case work is needed to size up and determine the needs of the individual family. The meeting of such needs should then engage the attention, not only of public and private relief agencies, but of clinic directors or family physicians as the case may be, public health nurses, medical social workers and rehabilitation agents. There should be frequent case conferences of such workers with one another. The Tuberculosis Associations should recognize that they have a responsibility for organizing citizen support that will make it possible to secure the increased tax funds needed for the provision of a suitable standard of living for such families and for the employment of technically trained people to provide them with the friendly oversight and the understanding guidance and supervision that they need.

A Review of Certain Principles in Management Of Thoracic War Wounds*

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THE writer's experience is based on the care of approximately 1,000 casualties seen in 31 months overseas in the Mediterranean and European theaters. Further information has been gained by study of the case records of the writer's unit, the Second Auxiliary Surgical Group, whose surgeons cared for nearly 5,000 thoracic casualties.

The following discussion will be limited for the most part to aspects of the treatment of thoracic casualties which have direct application to civilian practice. It must be emphasized that many of these aspects of therapy are not new but rather that their value has been reemphasized following their extensive employment in the treatment of thoracic war wounds.

It is of considerable importance to remember that shock in thoracic wounds or injuries is many times initiated and perpetuated by disturbances in cardiorespiratory physiology and persisting pain; hemorrhage is oftentimes of only secondary consideration. It follows, therefore, that the correction of disturbed cardiorespiratory physiology is of greater moment than fluid administration in the correction of shock. When fluids are needed, blood is usually most important. Plasma was and is used in an emergency but crystalloids are usually not necessary unless there is definite evidence of dehydration.

THE CONTROL OF PAIN

In thoracic injuries, pain may be due to severe contusion of the soft tissues or to fractured ribs. Intercostal nerve block given either locally, regionally (at the angles of the ribs), or paravertebrally has emerged as one of our most frequently used means of controlling pain. In general, 5 ccs. of 1 per cent procaine have been injected into each intercostal nerve covering usually either one or two nerves both above and below the area of tenderness as outlined on the chest wall. This means of controlling pain is entirely applicable to civilian injuries. In dealing with war wounds adhesive strapping of the chest was almost entirely discarded because it was cumbersome, unphysiologic, and many times the patients were more uncomfortable with adhesive strapping than without. Usually, the effects of nerve block last for at least 24 hours and the block can be repeated as often as necessary. Nerve block can also be used in controlling pleuritic pain and in the treatment of herpes zoster.

THE WET LUNG SYNDROME

Trauma to the lung either directly from a wound or indirectly from injury to the thoracic wall produces greater or lesser degrees of contusion with diffuse interalveolar and interstitial hemorrhage, localized pulmonary edema, and probably increased secretion from the bronchial mucous glands. Such excessive secretions and blood within the lung must be taken care of either by evacuation through the bronchial tree or by

* From the Department of Surgery, Stanford University School of Medicine, San Francisco, California. Read before the California Trudeau Society and the California Tuberculosis and Health Association, San Francisco, April 24, 1946.

absorption. When secretions and blood flood the bronchial tree in large amounts the patient at times is unable to expectorate these as fast as they flow into the bronchi and the resulting picture has been designated as the "traumatic wet lung syndrome."

These patients have an almost continuous harassing cough which is only partially productive. They are usually dyspneic and apprehensive. Numerous rhonchi are present over one or both lungs. The respirations are bubbling in character. Roentgenograms may or may not show atelectasis, even though the patients are in a very serious condition clinically. When the condition is unrecognized it can lead directly to death by asphyxiation. The presence of a traumatic wet lung always increases operative risk and surgery in these patients ordinarily is postponed until an adequate airway can be maintained. The aim of treatment is to improve bronchopulmonary drainage. Morphine in large amounts and sedative cough mixtures are expressly contraindicated. Because many patients have a very painful cough, the thoracic pain is relieved by intercostal nerve block. Voluntary cough is then urged. Carbon dioxide is then given if available to increase the efficiency of the cough. Oxygen may be necessary if the patient is cyanotic. Should secretions continue to flood the bronchi in overwhelming amounts, mechanical suction is resorted to without delay. Bronchoscopy may be used. Since it is frequently necessary to aspirate these patients several times a day, tracheobronchial catheter aspiration is an excellent means of keeping the bronchi clear. This can be done with very simple apparatus and may be performed at hourly intervals, if necessary, without using anesthesia.

CARDIAC TRAUMA

Three and three-tenths per cent of all penetrating wounds of the thorax in our series showed wounds of the heart or pericardium. Twenty-eight per cent of this group of 75 patients had cardiac contusions. These, of course, were non-surgical lesions but were very important to diagnose because such patients tolerated major surgery very poorly. In general, they were treated as acute coronary occlusions and surgery was postponed whenever possible for at least 24 to 48 hours. In caring for civilian thoracic wounds, those patients who have received crushing injuries of the chest in which any part of the force is applied anteriorly should be suspected of having a cardiac contusion and appropriate measures taken to determine its presence.

A few modifications in the standard technique of caring for cardiac wound were made in treating war wounds of the heart. We felt that a transpleural approach to the heart was superior to attempting an extrapleural approach and we will continue to carry on this practice. The pericardium was found useful in reinforcing suture lines when the myocardium had been repaired. In all cases the pericardium was drained directly into the pleural cavity at the end of operation. In some instances free muscle transplants were used

when the myocardial defect was too large to suture directly.

TREATMENT OF PRESSURE PNEUMOTHORAX

It was found that the commonly accepted method of introducing a large-bore needle into the pleural cavity should be reserved for dire emergency only. It was not good policy to continue the use of an indwelling needle even when it was attached to a water-trap bottle. Far more preferable was the introduction of a No. 18 to 20 gauge catheter, preferably the mushroom type, in an upper anterior intercostal space. The catheter was then attached to a water-trap bottle. It was found that the larger calibre of the catheter was often successful in controlling a pressure pneumothorax when a smaller calibre in a needle would not do so. In general, the calibre of the drainage tube should be larger than the rent in the lung if the lung is to expand.

These principles can be applied directly to the treatment of pressure pneumothorax in civilian thoracic injuries. In addition, the catheter treatment is excellent in cases of idiopathic spontaneous pneumothorax in which positive pressures are recorded or in which the pneumothorax has not absorbed in a reasonable length of time.

THE TREATMENT OF HEMOTHORAX

There was much controversy in this country prior to the war as to the proper treatment of a hemothorax. This centered around the question as to whether or not a hemothorax should be aspirated routinely or for symptoms only, and whether or not there should be air replacement after the blood was withdrawn. Experience in our theater indicated that early and repeated aspiration of the hemothorax was the treatment of choice. Often this was started within 24 hours of the time the patient was injured and continued daily as long as much as 100 to 200 ccs. of blood could be obtained. Air replacement was not used. There was no evidence at any time that this method of treatment caused increased bleeding.

The blood clotted in about 10 per cent of hemothoraces following war wounds. Some of these could be aspirated with considerable difficulty through large bore needles; in others with a combination of watchful waiting and breathing exercises the blood-clot eventually absorbed. The infection rate in clotted hemothoraces was distinctly higher than in non-clotted hemothoraces; the infection rate in unaspirated hemothoraces was higher than in those in which early and vigorous aspiration was carried out.

Clotting of the blood in the pleural cavity frequently led to organization. This is the phenomenon of early proliferation of fibroblasts and angioblasts into the clot from the visceral and parietal pleural surfaces. Organization may progress with eventual formation of a firm peel of fibroblastic membrane which may reach a thickness of a centimeter or greater. The outer or older surface (that adherent to the pleural sur-

faces) eventually becomes composed of adult fibrous tissue. It is of extreme importance to recognize that in these cases *there is no thickening of the visceral pleura*. It was found that the essential pathogenesis of hemo-organization was not changed by the presence of infection and that the same general type of peel resulted in empyemas which developed in a hemothorax. Recognition of the pathology of a hemo-organization has been of great importance in leading to re-evaluation and re-employment of the operation commonly known as pulmonary decortication.

Decortication has been used about six weeks after injury, in cases of uninfected organizing hemothorax when roentgenograms showed a generalized hazy chest or where the patient exhibited retraction of intercostal spaces, poor expansion, diffuse thoracic pain, or dyspnea. The employment of operation in such individuals has been insurance against the development of chronic fibro-thorax and chronic pulmonary invalidism.

THE INFECTIOUS COMPLICATIONS OF HEMOTHORAX

In early war experience from 25 to 30 per cent of all post-traumatic hemothoraces became infected. With a better understanding of the mechanics of intra-pleural pathology, with increased operative skill, and the early and vigorous use of thoracentesis with rapid re-expansion of the lung, the empyema rate in the Mediterranean theater fell to 7 per cent in the last six months of the war.

The management of infected hemothorax depended on the condition of the lung, the size of the hemothorax, and the general condition of the patient. If the hemothorax was small and basal, aspirations were usually continued for a short period of time and adequate rib resection with drainage was then done using a water-trap bottle. This operation was frequently performed before a gross empyema became apparent.

When the infected hemothorax (or hemothoracic empyema) was total, with complete collapse of the lung or if the lung were 25 per cent or more collapsed with a compression of the apex, early decortication was employed. This operation was done as soon after infection was discovered as the patient's condition warranted. It can be seen, therefore, that the indications for decortication have been greatly broadened since the beginning of World War II. It is now considered to be an operation applicable to the acute or sub-acute phases of empyema rather than to the chronic phases of empyema.

In general the results have been excellent. Over 75 per cent of cases with total or sub-total

empyema on whom decortication has been performed have had complete pulmonary restoration and primary cure without a recurrence of the empyema. In the other 25 per cent, the recurrent empyemas usually have been basal and have responded well to rib resection drainage. In more than 125 cases on whom we have performed decortication there have been no operative deaths.

TECHNIQUE OF DECORTICATION

This operation usually is performed through a posterior or postero-lateral thoracotomy incision. On entering the pleural cavity all fibrin, pus, and clots are removed leaving a pebbly reddish-brown surface behind. This is the surface of the peel which is incised down to normal pleura. With slight positive pressure the lung herniates through the peel. It is to be emphasized that in all these cases, the peel or fibrous membrane overlies the pleura, the pleura itself being an entirely normal thin translucent membrane. Once the cleavage plane is established the peel is removed by combined sharp and blunt dissection from the surface of the lung. The fissures, the diaphragm, and the mediastinum are completely freed down to the hilum so that complete circumferential expansion can be gained. The peel is removed to the junction of its reflection onto the parietal pleura and no attempt has been made to decorticate the parietal pleura.

Intercostal water-seal drains have been employed in all cases, usually one tube in the eighth intercostal space postero-laterally and one in the first or second intercostal space anteriorly. These are connected with water-trap bottles. Penicillin is introduced intrapleurally and in severe mixed infections we have no hesitancy in placing both penicillin and crystalline sulphanilamide in the pleural cavity. Layered closure with fine silk has been performed and intercostal nerve block has been used routinely to control the immediate post-operative pain.

The application of decortication to similar problems in civilian life is obvious. Post-traumatic total empyemas are met with not infrequently following crushing injuries to the chest. While our experience is more limited, we feel that total post-pneumonic empyemas will likewise respond well to decortication in the acute and sub-acute phases. With the present standards of thoracic surgery, competent intratracheal anesthesia, adequate blood replacement, and chemotherapy, there is no reason for postponing decortication until a chronic empyema has developed after months or years of suppuration. Used under proper circumstances, it is an operation which can be performed in any case within a very few weeks of the time of injury or original infection.



Plombage in the Treatment of Pulmonary Tuberculosis*

A Preliminary Report of Use Following Unsuccessful Thoracoplasty

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PLOMBAGE, or the introduction of paraffin into a surgically produced extrapleural space, has been a controversial method of treatment in pulmonary tuberculosis. This procedure has not been used in our practice as a primary operation in preference to thoracoplasty or extrapleural pneumothorax since 1938. Recently we have employed plombage to effectively close tuberculous pulmonary cavities following unsuccessful thoracoplasty. Our revived interest in this type of collapse therapy led to an inquiry into its current use in this country.

In 1913 the operative mortality of thoracoplasty was very high. At this time Baer introduced the operation of plombage to provide collapse of the lung with lessened surgical risk. It became very popular in the European continent in the 1920's and was gaining in popularity in the United States in the 1930's. However, the improvement of technique in thoracoplasty and the introduction of extrapleural pneumothorax into the surgical armamentarium for pulmonary tuberculosis led to a gradual decline in the use of plombage. The American literature in recent years contains few references for this operation. Steele¹ has employed plombage in preference to thoracoplasty for small apical cavities not over 1½ centimeters in diameter and for infiltration not over 5 centimeters in diameter. He includes in this article a case report in which plombage was used unsuccessfully following thoracoplasty to close a tension cavity. In a personal communication Alexander and Haight² report an occasional use of plombage for apical cavities in patients with low pulmonary reserve. Tuttle and O'Brien³ and Head⁴ present a similar point of view. However, the majority of surgeons in this country fear the complications of plombage and routinely use extrapleural pneumothorax in cases with low pulmonary reserve.

Although thoracoplasty has been proven the most satisfactory method to provide permanent collapse of the lung in pulmonary tuberculosis,

there is a small group of cases in which this operation has failed to close the tuberculous cavity. The persistence of the open tuberculous cavity following thoracoplasty has been an anathema to the surgeon. Revision thoracoplasty, lobectomy, and open drainage of tuberculosis cavities have been the usual measures employed. Each of these procedures have definite indications and limitations, which are outside the limits of this summary. Plombage has been found successful in certain selective cases. The type of case most suited to plombage is the one with the small cavity close to the spine which persists after thoracoplasty. Here revision thoracoplasty is usually unsuccessful. As in "primary" plombage, the operation is contraindicated if there is present a tension cavity¹ or a thin wall cavity situated just below the pleura. If it appears that the cavity may be closed by revision thoracoplasty, this should be tried first. The technique of the secondary operation differs little from that of the primary procedure. Accurate localization of the cavity by planograms and the introduction of a needle over the cavity with the aid of fluoroscopy is important. To be most effective the plumb should be inserted directly over the cavity. Sufficient time must have elapsed to allow regeneration of the ribs. This is necessary so that there will be a firm wall to offer counterpressure to the plumb. Care must be taken not to break into the tuberculous pulmonary cavity. The foreign body left in the chest wall is small. Usually only from 25 to 50 grams of paraffin are needed. There is little shock from the operation and the postoperative course is smooth. A case history illustrating the use of plombage following unsuccessful thoracoplasty was presented. Although the present experience with this procedure is limited, further trial is indicated.

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* From Olive View Sanatorium, Los Angeles. Read before the California Trudeau Society and the California Tuberculosis and Health Association, San Francisco, April 24, 1946.



Observations on Mass X-Ray Surveys*

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WILL ROSS, president of the National Tuberculosis Association, recently said, "The job which lies ahead of us in the control and eradication of tuberculosis is more difficult than the job which lies behind us." Despite tremendous gains already made, this appraisal seems to be essentially correct. The time lag between pathological activity of early tuberculous lesions and the appearance of symptoms will require increasingly that we go out and look for the active minimal cases which, if not discovered, become open, advanced cases. Then, there is greater difficulty in accurately assessing activity or inactivity of minimal cases as contrasted with more advanced lesions.

Since minimal lesions will increasingly form the bulk of cases found in surveys, errors in diagnosing active lesions as inactive will tend to allow progression of disease. There will probably always be more or less shortage of doctors, public health nurses and other personnel, particularly in official agencies, to carry out a complete tuberculosis control program. Finally, there is the human element, the lack of cooperation which, in the occasional patient hinders the execution of the desired isolation or treatment regime and often results in continued exposure of others to infection. These factors, some of which are inherent and unavoidable, will prevent an easy or early attainment of the goal of eradication of tuberculosis.

It is the aim and goal of the U. S. Public Health Service that every person in the United States should have a chest x-ray. However, lack of x-ray equipment and personnel prevents early execution of a total mass survey program, and selection must be made of the groups which will be most productive of active and open cases, such as those with symptoms of chest disease, contacts of known cases, certain racial groups, and those in the lower economic levels.

One method of case finding which can more readily be put into effect at present and which deserves to be stressed is routine chest x-ray examination of all patients entering general hospitals, both public and private. The importance of expanding this field lies both in its productivity in cases of tuberculosis, and protection of hospital personnel and of other patients against acquiring tuberculosis. The American Trudeau Society Committee on Tuberculosis among Hospital Personnel, studying the extent to which hospitals are using routine chest x-ray examinations, found that only 6 per cent of 934 hospitals x-rayed all patients. Hullerman,¹ in a study of 1946 hospi-

tals, found that 5.3 per cent x-ray all patients and employees and 8.0 per cent x-ray patients only.

Despite the fact that relatively few hospitals do routine survey work, the reports from these hospitals indicate it is a productive field. Block,² in a fluoroscopic survey of 25,000 patients since 1934, found 4.0 per cent to have tuberculosis, with 2.64 per cent clinically important. Plunkett and Mikol,³ in a survey of 4,853 admissions to 14 upstate New York hospitals, found 2.6 per cent tuberculous, with 1.1 per cent clinically significant. Pohle, Paul, and Oatway⁴ found 2.4 per cent tuberculous, with 0.8 per cent having active disease in the Wisconsin General Hospital. Scatchard and Duszynski,⁵ of Buffalo, report 1.4 per cent of 1,832 hospital admissions had unsuspected pulmonary tuberculosis. Of a group never seen before in the hospital or clinic, 3.6 per cent were tuberculous. Bauer, Goldsmith and Steele,⁶ at San Luis Obispo General Hospital, used 14 x 17 films to survey all new admittances and, over a two-year period 5.0 per cent were found to have active reinfection type pulmonary tuberculosis. Hilleboe⁷ states that one-fifth of all deaths from tuberculosis in the United States in 1943 occurred in general hospitals. If one adds to this the unsuspected cases that are entering hospitals constantly, and the fact that there are 15,000,000 hospital admissions a year, it is obvious that this represents a golden opportunity for case finding.

Protection of hospital personnel against infection is a factor which should be enough in itself to entirely justify an x-ray survey program. Boynton,⁸ as a result of a study on the rate of infection in three groups of students at the University of Minnesota, found that student nurses on a general hospital service have 100 times the chance of acquiring infection with the tubercle bacillus as students in the school of education, and the hazard for student nurses on a tuberculosis service was 500 times as great. Palmer⁹ found that student nurses in general hospitals without tuberculosis service went from about 15 per cent positive to the first dose of P.P.D. on entrance to training, to 27 per cent positive after 30 months' service. Student nurses with tuberculosis service went from 13 per cent positive to 50 per cent positive after 30 months' service. The American Trudeau Society survey¹⁰ indicates very clearly that most hospitals, particularly those that do not knowingly admit tuberculous patients, rely on the policy of exclusion of such patients for protection against infection. Only one per cent of hospitals refusing to admit the tuberculous, x-ray their admittances, to compare with 16 per cent in hospitals that admit these patients. This policy reminds one of the monkey who, covering his eyes, sees no evil. It has been estimated that the number of tuberculous patients who are

* From the Bureau of Tuberculosis, California State Department of Public Health. Read before the California Tuberculosis and Health Association, San Francisco, April 24, 1946.

thus not recognized in general hospitals in the U. S. is 40,000. This reservoir of infection, which accounts for transmission of the disease to doctors, nurses, and other employees and patients, should not be neglected, especially since they can be investigated by large films, laboratory and clinical examination so much more readily than industrial or other groups.

The economic aspect of survey methods in private hospitals deserves some comment. A question that arises with consideration of establishing of a survey unit is how the cost shall be handled and what the patient should be charged. The basic principle to be kept in mind here is that this is a public health procedure and, as such, should be carried out on a cost basis. The American College of Radiology has recognized this policy in establishing a charge of \$15 an hour for interpretation of survey films. The same procedure should be followed in taking care of the cost of the non-professional portion of the screening process. The charge can be entered in the patient's bill as a routine charge, as in the case of routine laboratory work or absorbed in the room charge. In fact, some hospitals, such as the University of Michigan Hospital, are carrying the cost without charge to patients. In Cleveland, ten hospitals have entered into a project of surveying all patients.¹¹ In addition, they will x-ray all employees annually, student nurses every six months, and out-patients on admission, and thereafter, annually. No charges are to be made for the interpretation. Technical costs are absorbed in the per capita per diem cost. Reports are sent to the attending physician, to the patient's chart, to the x-ray department, and to the health officer, who, however, does not consider this a report of a case until confirmed by further x-ray and laboratory examination. Mount Zion Hospital, in San Francisco, x-rays all admittances with 14 x 17 films, paid for by the San Francisco Tuberculosis and Health Association. There is no charge for interpretation.

After the miniature film is read, a large film is imperative and the radiologist should resist the pressure that may develop to secure a diagnosis on the basis of the miniature film. From the reading of the screening film, the follow-up x-ray and clinical examination of suspected cases becomes a matter of medical diagnosis and the customary procedure of charge for diagnostic work may be followed.

In the early days of chest x-ray surveys, it was routine practice to require the removal of clothing over the chest. Recently various workers have experimented with x-raying through the clothing. In a comparative series of stereoscopic 4 x 10 films, with and without clothing, opportunity was given to assess this method. Men were asked to remove coat and vest, drop the suspenders, and remove the contents of the shirt pocket. With women the jacket or coat was removed, as well as any large metal pin or clip. In this series, the films taken through the clothing showed a variety of shadows. In the case of men, it was often impossible to differentiate one film from another. Tie clips were usually almost invisible through the

heart shadow. In one man, a leaded silk tie could be faintly seen. In the case of women, many snaps, hooks, eyes, safety pins, and other small metallic objects could be seen. Large metal buttons were usually behind the heart shadow. These extraneous shadows probably have a nuisance value with some interpreters, but the important consideration is whether any such shadow could either cover up a small pulmonary lesion or could be confused with a pulmonary lesion. In the films of this series there were no shadows which could have obscured a lesion. There were two cases in which a bone button shown in profile might be confused with a calcified lesion. In stereoscopic films, it can usually be determined that it is extrapulmonary. When located over the apex, stereoscopic localization was more difficult. As a result of this series of films, it was concluded that with certain precautions, and where time is an important element and stereoscopic films are used, there was no serious objection to the method of x-raying through the clothing. The precautions to be taken in addition to those mentioned are, to watch closely for buttons overlying the apices and for clothing ornamented with sequins or metal ornaments and, in these cases, require removal of such clothing. In the case of single films, particularly the 35 mm. film, further studies should be made before applying this method in all survey work. In any event, the possibility of having to call back an occasional individual for a second x-ray must be recognized.

Protection of personnel against excessive x-radiation is a matter which should claim the serious attention of every individual and agency operating a photofluorographic unit. Eighteen times as much radiation is needed for a photofluorogram as for a conventional chest x-ray and the number of exposures per day usually is much greater, especially in the most recent types of units where over a thousand patients per day can be x-rayed. Morgan and Lewis,¹² in a detailed study of radiation from a photofluorographic unit, have plotted the amount of radiation in the entire surrounding area. Morgan's data clearly show that the technician standing back of the control, without leaded screen protection, at 100 exposures a day, receives 60 per cent more radiation than the recognized limit of 0.1 r per day. The data are based on exposures at 100 K. V. and 30 M. A. S. with a 35 mm. unit, located in the center of a large room. Such a location gives a minimum of secondary radiation. Factors which increase the radiation are: enclosure of the unit in a small space, especially with wood or masonite walls, use of a 70 mm. or 4 x 5 unit, absence of a limiting cone or diaphragm or of a grid, and decreased kilovoltage (with the necessary compensating increase in time).

Checks of three existing photofluorographic units in Southern California were made by the Bureau of Adult Health, Department of Public Health. In one of these, a 4 x 5 stationary unit, in a medium sized room, the relation of the tube and the leaded screen was such that adequate protection was not afforded until another wing of leaded screen was added. In the two other units,

a 4 x 5 unit was mounted in the close quarters of a bus. Neither of these units had a diaphragm, limiting the radiation to the screen. These three factors increased the secondary radiation as predicted by Morgan. In a position directly behind the control and leaded screen, measurements indicate that as high as 1,000 exposures per day may be made with safety with the factors used in the tests—95 K.V.P., 100 M. A. and variable time. However, in a position behind the leaded screen at the opposite end of the bus, there was twice as much radiation as in the operator's position. This is undoubtedly due to secondary radiation resulting when the direct radiation escaping past the patient, strikes the wall and door of the dark room across the passageway from the assistant technician.

Tests made at points along a transverse line across the bus, starting with the operator's position back of the control, show a progressive increase in radiation. Any position beyond the edge of the leaded screen, without question, is not safe for continuous exposure of the operator. Even in a position at the corner of the control, where one is still shielded from the x-ray tube, there is radiation exceeding the safe limit of 0.1 r per day. This again indicates that secondary radiation emanates largely from the walls of the dark room and storage cabinets opposite the x-ray machine. This secondary radiation was cut down about 50 per cent when a limiting diaphragm was installed on the tube. The tests clearly indicate that the only safe positions in this type of set-up are squarely behind the protective leaded screens.

Two conditions were discovered in one unit which lead the technician to stand at the side of the screen rather than behind it. The technician was not tall enough to see the patient through the lead-glass window in the screen and there was not enough light in the bus to see the patient clearly. A stand placed back of the control and

an auxiliary light, trained on the patient's position, made it possible for the technician to feel reasonably sure of securing a good x-ray without standing in a dangerous position. To sum up, it is vitally important to know what the conditions are in the photofluorographic units, under the conditions in which they are being used, in order that technicians who are using larger quantities of radiation than in conventional, diagnostic radiography may be assured of safe working conditions.

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Putting Miniature Films To Work— Follow-up By Health Department*

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THE rapidity of development of new apparatus and techniques for the taking of miniature x-rays has been one of the most outstanding developments of the past decade in the field of tuberculosis control. The fact that it represents an outlay of large sums of money and requires the hiring of but few personnel has increased the glamour of its institution. It has to some extent come to be regarded as an end, rather than as a step in the control of tuberculosis. Planning has been directed more toward the taking of vast numbers of x-rays rather than the successful iso-

lation of definite vectors of the disease, and the health education of the community. This lack of planning has resulted in inefficient work, with the loss of many cases which should have been hospitalized. No mass x-ray survey should ever be undertaken until there has been adequate planning for each step in the process. Each community has a different problem, depending upon such factors as the adequacy of clinic service, the extent of public health nursing, the location of trained phthisiologists, etc. We must agree with Hilleboe and Morgan in their Mass Radiography of the Chest, where they say: "The value of mass surveys should be measured in terms of completeness and adequacy of further clinical examination, care and therapy. It is useless to discover

* From Wish-I-Ah Sanatorium, Auberry, California. Read before the California Tuberculosis and Health Association, San Francisco, April 24, 1946.

new cases unless an attempt is made to do something about them."

The ease with which a follow-up may be done will depend upon the deliberations around the preliminary council table prior to the taking of the first film. If there is a weak spot in the organization which is to do the follow up, steps should be taken to strengthen it. This again is a community problem, but it is one which the voluntary organizations cannot afford to ignore. Health education is one of the foremost needs of all communities. Is it being adequately covered in yours? In your distribution of literature at the time the survey is being done, is the procedure being referred to as confidential? If the word "confidential" appears in your literature are you justified in turning cases over to the health departments for public health nursing calls? Do you wish your health officer to enforce the provisions of the health and safety code with respect to tuberculosis? If you do, eliminate the word "confidential" from all of your procedures and the path of your health department will be smoother.

In early planning for mass x-rays the decision has soon to be made as to the type of record card or letter which will be used for negative chests, and what other groups will have to be included under the group negative. Obviously, any attempt to tell all individuals of each little abnormality in the x-ray will produce a mass of stenographic detail which will be prohibitive. I would like to commend the Basic Project Record with its 1B Notification Record, as issued by the United States Public Health Service. The opening sentence of this notification record says: "On the date shown below an x-ray was taken of your chest. You will be glad to know that the condition of your lungs appears satisfactory on the x-ray film." The grouping together of all negative chests, abnormal ribs, minor pleural thickening, and calcifications will permit of the sending out of these notification records to about 95 per cent of the persons participating in the survey. It is perfectly true that a minute detailed investigation of the contacts of these persons might disclose a very rare case, but the expenditure of effort involved is not justified by the returns. Any one familiar with the psychology of physicians must be impressed by the effect of six or seven primary calcifications being referred as suspicious or definite tuberculosis, to a single physician in one afternoon.

This not infrequently happens. Too many such referrals breaks down his confidence in the program, whereas the referral of significant cases builds up his morale. Also, the referral of too many suspected cardiac cases, which represent quite often obese or hypersthenic individuals taken with a distance factor below the standard 60 inches, tends to establish critical feeling on the part of a physician who has to remove a cardiac neurosis from the minds of his patients.

The sending out of definite notification to the negative group has value from the point of view of seal sale. It also can be used, as stated, to obviate the follow up of minor changes. This re-

duces materially the load on the health departments, and it has value as a health education procedure. The basic record on these cases may then be destroyed and the film only filed. This is made possible because the notification card of the U. S. P.H.S. Basic Project Record makes each individual the custodian of his own record, since it contains the number of the project, the film number, and the date taken. Considerable filing space is thereby saved.

In planning a survey and its follow up some decision has to be made as to where the health department will enter the picture. The procedure has varied according to the community. In some places the voluntary agency has assumed responsibility for the follow up to the point that only cases referred to the health department have been those who have been unresponsive. If large numbers of cases are to be surveyed and the official workers are few, it would seem advisable for the voluntary group to enter to a larger extent into the follow up. Too often the official agency is handed a mass of somewhat unproductive material, which can only be followed by either overloading workers, or by giving up what is often more productive work in favor of the politically expedient thing.

When the material has been reduced to the irreducible minimum and each individual has been in receipt of a letter from the voluntary agency, the time has arrived to bring the public health nurse into action. The letters should be very carefully worded, and I believe the word "tuberculosis" should be avoided in favor of what is called by D'Abreu of Brazil, "the bearers of shadows." Too often x-rays turn out to be "bearing shadows" due to non-tuberculous causes. The phthisiologist will therefore beg that these letters state that shadows are present in the x-ray, which makes it necessary for the individual to consult either his private physician or a chest clinic immediately. The cardiologist will beg that the patient be not unduly alarmed by reference to heart disease.

The first problem facing a doctor who is handed a group of these miniature x-rays and records falling into the classes of definite tuberculosis, suspicious tuberculosis, cardiac, or other pathology, is to quickly survey these to see if he agrees with the classification, or if further non-essential material can be eliminated. He also has to decide what can be regarded as in need of early disposition; that is, what some people refer to as emergent. Early contact by either another letter or by public health nurse visit must be done in these cases.

There arises here the question as to what per cent may respond to a letter type of approach. One voluntary organization found that 40 per cent of the individuals notified by letter responded and were re-examined. When they added a follow up nurse to the program this was increased to 63 per cent. This is still far from a perfect record, and serves to emphasize the need for a more intensified follow up program. It is still far ahead of what probably occurs to the follow up in a

great many communities in this state. When a letter is sent out it should allow a lapse of time of approximately two weeks before further letter or nurse visit is made. The success of any tuberculosis control program is in direct ratio to the intelligence, interest and persistence of its public health nurses. They are the keystone of the program.

In following up these cases I would like to make a plea for two things. First, that the economic interests of the individuals under study be protected. No single miniature x-ray makes a diagnosis. Endangering his job by lack of caution in approaching the individual may destroy his relationship with the tuberculosis program. Secondly, I would like to emphasize the necessity for maintaining the private-practitioner-patient relationship. No matter what our ideas on the subject may be, the private practitioner is still a very potent factor in the control program, since he is constantly seeing patients who should be hospitalized for tuberculosis. If he can be educated to the needs of these people and to cooperation with the official agency, much good may be accomplished. Where the program is inadequate and the beds few, he is the only bulwark against the disease.

Time cannot be ignored in dealing with human nature. I believe it is essential that these people be brought under control when active disease exists. I do not believe that high-handed attitudes should be developed, however. Where contact is kept with patients who will not accept hospitalization today, we find that they will sooner or later become convinced as to its necessity. Avoidance of the poor advertising of undue force, and reliance upon education (which is at best a slow

process), can accomplish much. However, where definitely bad public health situations exist it is within the province of the health officer to force not only examination, but also isolation. There are many problems involved, especially where a survey covers individuals high up in the social, economic and political levels of our community.

What constitutes adequate follow up is a fine question, which changes as does the whole field of biological thought. Our three greatest weapons are the skin tuberculin test of adequate dosage, the serial x-ray, and the repeated sputum test which includes pooled specimens, culture and guinea pig inoculation. These do not cover all the field but we must also remember the planigram, the lung lavage, gastric lavage, temperature records, etc.; and above all, the complete history which so few of us have time to do in our clinics.

The many problems which arise out of following mass surveys should make us somewhat sympathetic with the health officer. Not the least amongst these are case reporting and the endeavor to get patients under ethical practitioners of medicine, arranging hospitalization for those who need it and will accept it, disposing of those who need hospitalization and will not accept it, and having adequate examination made of the contacts. This is often a superhuman job in a rural county.

Let me reiterate that no mass x-ray survey should be undertaken until all the details of the follow up have been adequately arranged. This calls for a maximum of understanding and cooperation between all of the agencies involved. When this is achieved, the success of the program will be based not only upon medical knowledge, but upon social and economic factors.

Planning and Organization of a Case-Finding Program*

BERTHA V. PETERSON, *San Bernardino*

WE have a problem more peculiar to our county than possibly any other county in the state due to its extreme size. Our county is the largest in the United States, embracing some 13 million acres.

In addition, we have had a tremendous tuberculosis problem. Until recent years the death rate from tuberculosis in San Bernardino County was the highest of any county in the state. At present it is third from the highest. In analyzing our problem, we found that to reduce the incidence of tuberculosis we would have to carry on an intensive health educational program. What made it a little difficult was the fact that many of our private physicians were not tuberculosis conscious.

We realized that to make the program a successful one we would have to have their support. This, we feel, has now been accomplished.

Next, we set about contacting the general population throughout the county, telling them of our problem and what should be done about it. In talking to various groups explaining how tuberculosis could be controlled we urged them to have chest x-rays. Then we were put on the spot because in our county there were very few facilities for taking chest x-rays.

This matter was brought to the attention of the members of our Board of Supervisors. Realizing that the first step in control would be to find the active cases, they arranged to give us financial aid so that we could purchase our own x-ray equipment.

Through the efforts of our organization, the Board of Education of the San Bernardino City

* From the San Bernardino County Tuberculosis and Health Association, San Bernardino. Read before the California Tuberculosis and Health Association, San Francisco, April 24, 1946.

School System has made it compulsory for all of the adult personnel to have negative chest x-rays upon employment. These are repeated every three years. In cases where there has been activity at one time, repeat x-rays are required more frequently.

Previously we spent considerable time in conducting x-ray programs in the high schools throughout the county with the usual result of very little pathology. This last year only those students who were referred to us by the school nurses after having had the Patch test were x-rayed.

It is important to begin the planning of a program well in advance, preferably one month. First, we contact the health departments in an endeavor to arrive at a suitable date. We then send a representative of our organization to contact the civic leaders to enlist their interest and cooperation. As we rely entirely upon volunteers to help with the program during the time that the equipment is in a community, we enlist these workers. More work is entailed during the planning of the program when volunteer helpers are enlisted, but

there is no better way to bring about good public relations.

During the planning period the location for the setting-up of the equipment is arranged for, as well as hours of operation. It is wise to arrange a method whereby appointments may be taken prior to the day that the program is scheduled.

Publicity must be arranged for well in advance using every medium available. We start our newspaper publicity one month in advance; posters and hand-bills are distributed about one week in advance. Two days in advance announcements are started over the radio.

In conclusion I should like to summarize the steps necessary to be taken to insure a successful x-ray case-finding program. First, contact the health department and obtain cooperation of the Public Health Nurse. Second, plan the program well in advance. Third, contact civic leaders for support. Fourth, plan good advance publicity using all mediums available. Fifth, plan speaking engagements. Sixth, good location for equipment. Seventh, arrange hours of work for volunteer helpers. Eighth, proper follow up.

A Greater Future Through Public Relations*

N. T. L. PIEPER, *San Francisco*

PUBLIC relations is a term referred to frequently today. It means different things to different people. It is not just publicity nor is it straight promotion. Often we can sense good or bad public relations even though we find it difficult to define. Public relations concepts are broad. Perhaps we can best define public relations as the entire group of relationships that go to make up our impression of an individual or an organization.

Good public relations has contributed a great deal to the success of the Tuberculosis Association. Yours is an enviable position today.

The Tuberculosis Association has prestige. Its program is accepted. It is an integral part of the work in the field of public health. The Tb insignia is a well recognized and respected symbol. It stands out in the minds of the people. It represents the fight against tuberculosis and the never-ending fight for better health.

Seal sales are traditional. Public support and affection are best demonstrated by the hearty cooperation given the Association during the seal sales. Few groups have ever received such support from all media of publicity. We have come to expect to see the Tuberculosis seal appearing before us everywhere—in the magazines, on the billboards, in the press and even cleverly set out in our favorite comic strip. This is a great ac-

complishment. It is a great tribute from a friendly supporting public.

But what of the future? We cannot stand still. The future—a greater future will be the inevitable result of events and what we are doing about them today! Your successes did not come by chance. Hard work, contributed by many people built your present position. The continued hard work of many people and good public relations will assure a greater future.

For the Association to have reached its position of today, two things were of importance. First of all, you had to do a good job and secondly, you had to make your public aware of the good job that you had done.

As to the first point, the schedule of talks and subjects for discussion at this annual meeting gives evidence of your thinking, your plans and programs for continuing that good job. You will have to continue your service in the public interest in those fields in which you have proved your service so well. You will have to seek out and constantly search for additional new ways in which you can prove to be worthy of your present public support. As events and time bring changes you must be attuned to them and adopt your programs to meet the public need.

The kindly feeling toward your past performance in itself cannot sustain future support. In the realities and fast moving events in today's arena, performance must be the basis for continued support.

* Read before the California Trudeau Society and the California Tuberculosis and Health Association, San Francisco, April 24, 1946.

There is so much to be done—so many frontiers yet remain unconquered that there should be no difficulty in finding your place in tomorrow's scheme of things.

I have confidence that the job will be well done. But who will do it?

Everyone in the Tb Association—board members as well as staff must participate, must work.

Each must have a clear concept of the ideals and the goals of the Association. They must know their subject. They must not only be especially well informed or experts in this field of public health but must be so full of the subject that they can explain, discuss and convince others of the purport of your program. There must be enthusiasm as well as devotion to the work for without enthusiasm, the Tb program cannot be sold. It will not suffice that the interest of those presently working, be maintained. New persons must be brought in. Today many more people are free to help in the Tb program. The war period, as never before tapped new sources of aid. Many persons were aroused to the need for participating in programs directed to the public interest. Their war-time jobs are over. They can be aroused and interested in continuing their work with the Tb Association.

And how are we going to make the public aware of the job being done? Certainly through good press relations.

And who will do this? You will say your publicity director will handle it. Surely he will do his share. He will carry more than his share of the load, but he can't do it alone. This too is everyone's job. Your publicity director can't get the press coverage, can't write the stories unless you—all of you give him the information.

Members of the board, field and staff workers see the human interest, the interesting items, the drama that is such a big part of the fight against tuberculosis.

Campaigns are planned, advances are made against the common enemy. There are victories. You are in a war—a bitter war, one with the

greatest stakes—human lives. Surely you can all see the material that is available if you will only be aware of it. Be conscious of your part in this war and remember that unless you make it possible for your public to know what you're doing, they won't know that you have done anything. Should the public ever feel that you have failed to do a job, whether that feeling be based on failure to perform or failure to tell what you've done, public opinion will rise against you and all the great strides and wonderful record of the past will be swept away.

Public opinion is one of the most dynamic forces on earth. Public opinion in action is all-powerful.

You need have no fear if you continue to work hard, tell your story and lastly—avoid apathy. I make this last plea—this plea against apathy because it is one of those insidious forces that must be fought constantly. We Americans can list it as our greatest enemy. Let us just review what apathy has done to us and how nearly disastrous its effects have been during the last decade or so.

The crime waves of the early thirties were permitted to run rampant until we were aroused against the Dillingers and the Baby Face Nelsons by such shocking acts as the Lindbergh baby kidnapping and the Kansas City massacre. Up to that time, the F.B.I. was not even permitted to carry a gun. Previous to Pearl Harbor seditious Nazi, Fascist and Japanese organizations flourished.

The theme runs through all of our crises. "Oh, it can't be that bad." "Let someone else do it." Apathy has been the greatest enemy of prevention: prevention of crime, prevention of war, prevention of disease, the prevention of tuberculosis.

What of the future? The future is bright. Its challenges are many, but the opportunities for great successes are likewise many.

Good public relations will help assure that future by properly telling your story and by overcoming apathy.

Modern Concepts of Rehabilitation*

A. FRANCES BEERY, *New York City*

THE field of rehabilitation as a profession is relatively new; new enough to be still having growing pains. As a result of the experience of agencies and fields of work involved in rehabilitation, there is now a recognition that formalized education and training is and will be necessary. The National Council on Rehabilitation is attempting to define and establish standards for training and performance. But already from our experience in rehabilitation there have developed

certain philosophies which are considered fundamental in our approach. I shall discuss briefly five basic concepts.

1. *The meaning of rehabilitation itself* must be understood before other concepts can be discussed. The word rehabilitation is often misunderstood. Rehabilitation is the total restoration of the handicapped person to as normal life as is possible within the individual's and his society's capacities and limitations. This restoration includes his emotional, social, physical, mental, and vocational adjustment. This definition implies that the individual as a total personality is considered; that to restore the individual to a nor-

* From the Rehabilitation Service, National Tuberculosis Association, New York. Read before the California Tuberculosis and Health Association, San Francisco, April 24, 1946.

mal life involves counseling, not only regarding his job adjustment, but regarding his adjustment to his family, to society in general, and to himself. It also implies that many agencies may have a part in this total program. Thus the vocational counselor recognizes that if the patient has family problems his vocational problem most often will not be solved until the family problem is adjusted. This leads us to the second concept.

2. Rehabilitation of the patient includes rehabilitation of the family.

All professions concerned with the patient's adjustment realize now that although the handicapped member of the family is the focus of treatment, the family unit cannot be ignored. Tuberculosis is a physical handicap which especially involves family life, because the family unit is broken during hospitalization. Prior to and during and after hospitalization the family patterns are changed. The family members, too, must adjust to the disease. Their attitude about tuberculosis, their understanding of the necessary adjustments, and their willingness to modify and change their family life are basic parts of the patient's rehabilitation.

The best insurance for maximum adjustment is to help the family, as well as the patient, prevent problems from becoming acute. In other words, just as in medicine, related services are more effective when they are applied in the preventative stage rather than beginning these services with curative treatment, therefore—

3. Rehabilitation is a continuing process beginning at diagnosis, continuing during hospitalization and as long afterward as follow-up services are needed. How well he is going to be able to adjust himself to tuberculosis depends in large measure on the services which can be offered him at the very beginning of diagnosis and continuing after his return to his family and the community life.

Programs of medical social work in clinics have already demonstrated the value of helping the patient in adjusting family problems at the time of diagnosis. Counseling programs in hospitals have also clearly demonstrated important factors. One is that a patient's adjustment to his entire treatment, to his training and work possibilities, frequently depends on a program of vocational counseling starting as soon after admission to the hospital as his physical condition will allow and continuing during this period.

The patient's adjustment to a more normal life outside the hospital is often more difficult for him and his family than their adjustment to hospitalization. In some cases new problems arise and other problems continue for some time during the patient's adjustment to community life. Studies show that one of the difficult adjustments

for the patient is when he resumes employment. He may need counseling as much then as at any time during his illness.

4. The fundamental approach in rehabilitation is to make a total plan to meet each individual case rather than to fit the patient into a categorical plan. A plan of rehabilitation cannot be effectively applied to every case in the same way. Each individual patient and his family have individual basic problems and characteristics which have contributed to these problems. We may say that almost every tuberculosis family needs some form of financial assistance or that at least 90 per cent of tuberculous patients need vocational counseling, but how this counseling is given and what principle the patient and counselor apply would depend primarily on understanding the patient as an individual, as a member of a family group and as a part of his particular environment. Always, of course, all counseling is based on the doctor's recommendations and joint planning between him and the different personnel assisting in the patient's and the family's total adjustment.

5. The rehabilitation job is complete only when there is general community planning to meet all of the various phases of rehabilitation and to relate the various services.

Anyone who has been interested in any phase of health or social service knows that a segment of a total program is incomplete and often most inadequate unless there is a plan of community organization. In tuberculosis, a total community program of rehabilitation includes two concepts:

First, this program to be effective must establish both in and out hospital rehabilitation programs and these two programs must be organized and related. Thus the clinic social worker, the hospital social worker, and the social workers of both public and private agencies must all be aware of the total services needed, the gaps in services and how each service can relate its service to the other. The same is true of all other types of services involved in rehabilitation.

Second, the various fields represented in one particular setting, such as the clinic or hospital, must relate their programs of services. In the tuberculosis hospital, the social worker, the doctor, the nurse, the occupational therapist, and the vocational counselor must act as a team in order that they can plan a total program for the patient.

One problem common to all communities is the source of community organization regarding the development of programs for rehabilitation of the tuberculous. The responsibility for this is often assumed by the tuberculosis association and rightfully so, since rehabilitation in all fields represented in tuberculosis is relatively new and needs direction and leadership from those of us who believe that these services are vital to the control and treatment of tuberculosis.



COMMITTEE APPOINTED TO PROPOSE POLICIES AND TRENDS

A Committee on Policies and Trends of the California Tuberculosis and Health Association has been appointed by the Board of Directors.

The committee is under the chairmanship of J. D. Keith, president of the Contra Costa County Public Health Association, and has as its members Dr. Carl R. Howson, Dr. Chesley Bush, Dr. W. P. Shepard and Glenn V. Armstrong.

Attending the first meeting were Dr. Bosworth, president, and John W. Popovich, vice-president of the association. The committee proposes to meet in an all-day session quarterly, and to make a report to the delegates of the State Association at the annual meeting in 1947.

Meanwhile, the committee will inform the delegates of its deliberations and will ask from all Associations suggestions for its work.

At the first meeting the committee examined a brief report of the tuberculosis movement in California during the years since its first organization, and examined the policies of the Association as outlined by the Board of Directors during the past 15 or 16 years.

The memoranda in connection with the organization of the committee said: "The organized fight against tuberculosis during the last half-century has been marked by rather definite changes of direction coming in cycles of 10 or 15 years.

"At the beginning of each cycle, while preserving the advantages and progress of the past years, there emerged a new accent. These new accents were initiated by the tuberculosis experts and public health officials, but there was always a lag before it became accepted as sound by the medical profession and practical by the board members of our association.

"When a new accent became apparent to our leaders, the routine which had been established were difficult for administrators to change. For example: it was difficult to transfer clinics to public authority or to recognize the futility of preventoria, or the law of diminishing returns in tuberculin testing and x-raying of positive reactors of primary and grammar school children.

"The first long time planning program in California came as a result of the report of the committee of 100 appointed by the Governor of California about 1914 at the insistence of the tuberculosis associations of California. The report was implemented by the establishment of the Bureau of Tuberculosis and the Subsidy Law.

"When the California Tuberculosis Association was reorganized as a federation 15 years ago, certain basic policies were adopted which, it was predicted, would take 10 to 15 years to accomplish. These main objectives have been accomplished. The program policies and trend of voluntary health agencies have recently become the subject of national debate. A map of future policies and trends for official health agencies, national, state and local, has been drawn by the American Public Health Service. It seems imperative that the future policies and long-time objectives of the California Tuberculosis and Health Association should be explored and that they be presented to the representatives of the California Tuberculosis and Health Association for debate and action."

The detailed minutes of the meeting of the committee will be sent to members of the Federation and to the delegates of the Association.

The committee has appointed regular meeting days every quarter for a full day discussion.—*News Letter*, California Tuberculosis and Health Association.

APPROVE SMALL FILMS FOR HEART WORK

Increased usefulness of the miniature 4 x 5 films in tuberculosis mass surveys was described by Dr. Joseph Jellen at the annual scientific meeting of the California Heart Association, May 10, at Los Angeles.

The 4 x 5 miniature films have proved as useful in the detection of cardiac abnormalities as the standard 14 x 17 films, according to a study made by Dr. Jellen and Dr. William Paul Thompson sponsored by the Heart Advisory Committee of the Los Angeles County Tuberculosis and Health Association. Patients were examined clinically, by ortho-diagram, were x-rayed with standard films, and with 4 x 5 miniature films to discover possible variation in heart measurements.

Tuberculosis associations will find this study of use to them. Physicians reading miniature films for tuberculosis can be assured that the heart size is not distorted in the small films.

Dr. John C. Jones, a Los Angeles surgeon, described the present status of surgery in congenital heart disease and the function of internists in selecting cases suitable for the delicate operations.

Dr. Louis E. Martin, in a press interview, cautioned the public that several different types of heart disease cause "blue babies" and that parents should consult with their physicians before hopes are raised about successful surgery.—*News Letter*, California Tuberculosis and Health Association.

SAN LUIS OBISPO LEARNS WHY PEOPLE ATTEND X-RAY SURVEY

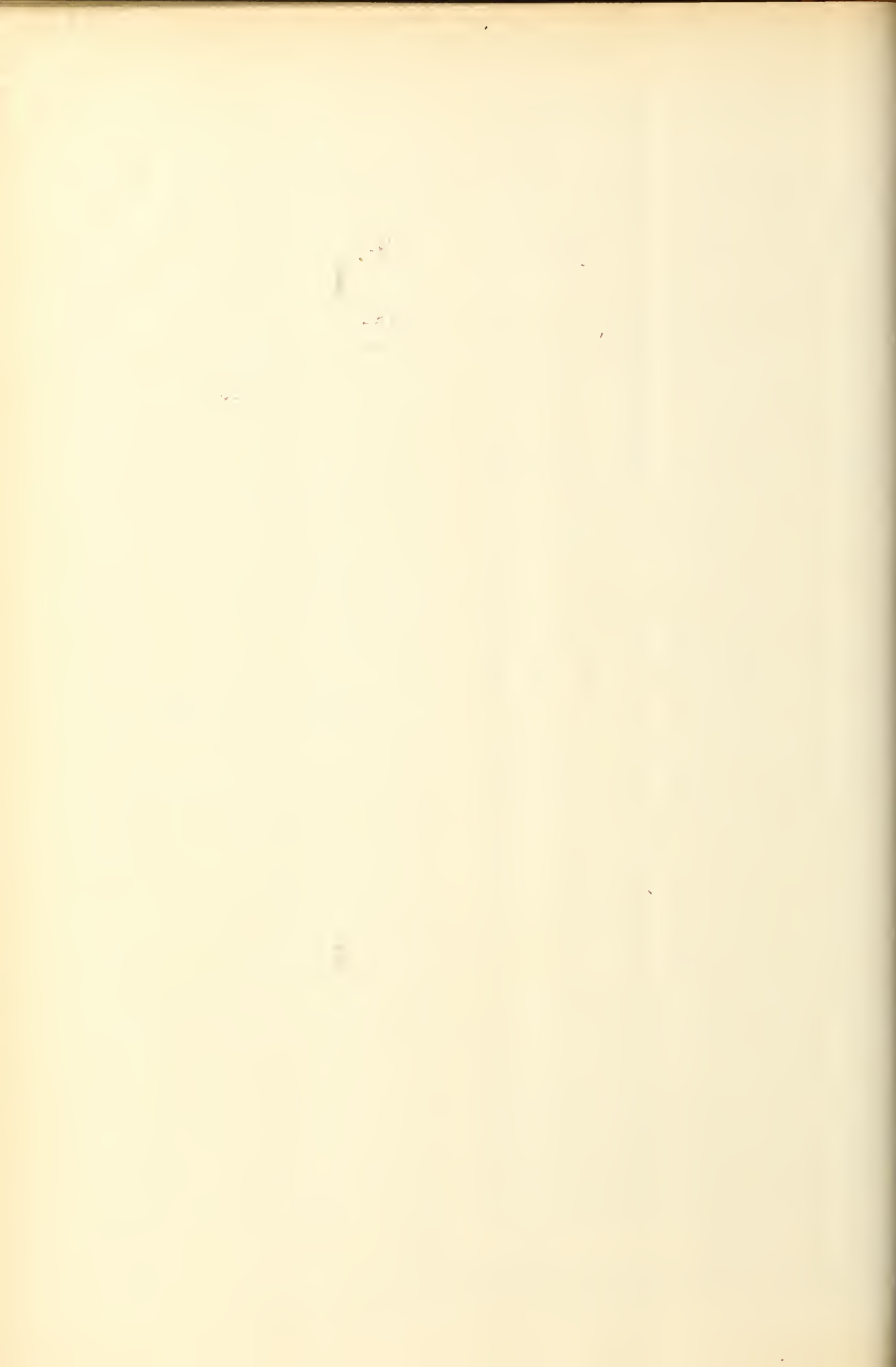
Who participates in an x-ray project and what prompts them to attend?

These questions were answered at a recent survey conducted by the San Luis Obispo County Tuberculosis Association. Interviews of individuals who came to be x-rayed were conducted by employees of the County Health Department, co-sponsor of the survey, under the direction of Health Officer Philip A. Bearg, M.D.

The survey was attended by 1,916 men and women 15 years of age and older. Fourteen communities in the county were given as home addresses.

Individuals were asked their occupations and in the case of non-employed married women, their husbands' occupations. Suspicious films according to occupations of husbands in the four principal groups were as follows: white collar, 4.2 per cent; skilled labor, 5.3; unskilled labor, 6.08, and farm labor, 3.3; retired, 16.1. Although the number of persons was too small to use the figures as the basis of general conclusions, the percentages are remarkably similar to those obtained in larger surveys and in analyzing other tuberculosis statistics. The percentage for the retired, though perhaps larger than usually found, reflect the importance of x-rays for the aged groups. Of the total number of films read, 114 were called positive or suspicious—that is the films revealed enough pathology to warrant diagnosis.

What was the medium which prompted persons to attend the survey? The various media mentioned follow: newspaper, 551; personal contact, 390; posters, 219; school, 208; circulars, 117; radio, 114; movies, 196; clubs, 53; church, 22; saw unit, 15.—*News Letter*, California Tuberculosis and Health Association.





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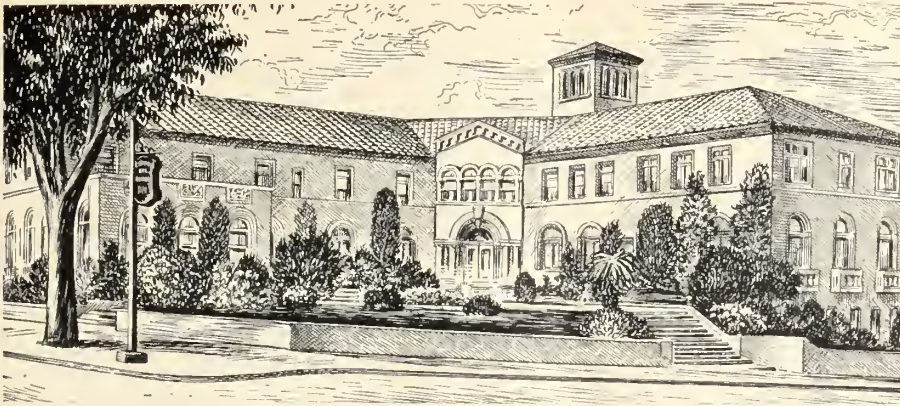
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(County society secretaries are requested to promptly notify "California Medicine" when changes are indicated in their roster information.)

Alameda County Medical Association
364 14th Street, Oakland 12
President, Warren B. Allen, 411 30th Street, Oakland 9.
Secretary, Dorothy M. Allen, 2923 Webster Street, Oakland 9.
Meeting, *Third Monday, 8:15 p. m., Hunter Hall, Oakland.*

Butte-Glenn County Medical Society
President, Hollis L. Carey, 567 Kentucky Street, Gridley.
Secretary, J. O. Chiapella, 131 Broadway, Chico.
Meeting, *Second Thursday.*

Contra Costa County Medical Society
President, George Kelso, 416 E. Fourth Street, Pittsburg.
Secretary, H. D. Neufeld, Box 338, Concord.
Meeting, *Second Tuesday, 8:00 p. m.*

Fresno County Medical Society
President, J. A. Thormann, Box 1908, Fresno.
Secretary, William L. Adams, Jr., 515 Helm Building, Fresno.
Meeting, *First Tuesday, University-Sequoia Club, Fresno.*

Humboldt County Medical Society
President, Walter Dolfini, 539 G Street, Eureka.
Secretary, Wayne P. McKee, Ferndale.
Meeting, *First Thursday.*

Imperial County Medical Society
President, Charles Cutshaw, Brawley.
Secretary, George Cole, Brawley.
Meeting, *Third Tuesday, 7:00 p. m., Barbara Worth Hotel, El Centro.*

Inyo-Mono County Medical Society
President, Walter L. Wilson, 103 N. Main, Bishop.
Secretary, Lloyd S. Bambauer, Bishop.
Meeting, *Fourth Wednesday, except December, January, February.*

Kern County Medical Society
President, William H. Macdonald, 2103 18th Street, Bakersfield.
Secretary, Frederick O. Wynia, 354 Habermeyer Building, Bakersfield.
Meeting, *Third Tuesday, 7:30 p. m., Stockdale Country Club, except June, July, August.*

Kings County Medical Society
President, Lionel W. Sorenson, 1118 Whiteley Avenue, Corcoran.
Secretary, William F. Chamlee, Van Sicken Building, Hanford.
Meeting, *Second Monday, 8:00 p. m., Legion Hall, Hanford.*

Lassen-Plumas-Modoc County Medical Society
President, Wilbur C. Batson, Greenville.
Secretary, John Paul McKenney, Alturas.
Meeting, *On Call.*

Los Angeles County Medical Association
1925 Wilshire Boulevard, Los Angeles 5
President, Louis J. Regan, 6777 Hollywood Boulevard, Los Angeles 28.
Secretary, E. T. Remmen, 429 North Orange, Glendale 3.
Meeting, *First and Third Thursday, 1925 Wilshire Boulevard, Los Angeles.*

Marin County Medical Society
President, Lloyd G. Tyler, 1010 B Street, San Rafael.
Secretary, Carl W. Clark, 1010 B Street, San Rafael.
Meeting, *Fourth Thursday, 7:00 p. m., Travelers Inn, San Rafael.*

Mendocino-Lake County Medical Society
President, J. E. Gardner, 215 W. Standley Street, Ukiah.
Secretary, E. C. Bennett, Ukiah.

Merced County Medical Society
President, E. R. Fountain, Merced.
Secretary, C. C. Fitzgibbon, Shaffer Building, Merced.
Meeting, *Third Thursday, Hotel Tioga, Merced.*

Monterey County Medical Society
President, Margaret Swigert, Professional Building, Monterey.
Secretary, W. A. Carnazzo, M.D., 411 Alvarado Street, Monterey.
Meeting, *First Thursday.*

Napa County Medical Society
President, Charles H. Bulson, 1203 Seminary Street, Napa.
Secretary, M. M. Booth, Bruck Building, St. Helena.
Meeting, *First Wednesday.*

Orange County Medical Association
President, John Montanus, Rt. 1, Box 587A, Santa Ana.
Secretary, Russell I. Johnson, 181 Westminster Boulevard, Westminster.
Meeting, *First Tuesday, 7:00 p. m., Windsor Cafe, Santa Ana.*

Placer-Nevada-Sierra County Medical Society
President, George A. Foster, Grass Valley.
Secretary, Vernon W. Padgett, Grass Valley.
Meeting, *At Call of President.*

Riverside County Medical Society
President, Franklyn D. Hankins, 3014 Pine Street, Riverside.
Secretary, N. K. Bear, 3655 Fourteenth Street, Riverside.
Meeting, *Second Monday, 8:00 p. m., Library, Riverside Community Hospital.*

Sacramento Society for Medical Improvement
President, Frank Reardon, Physicians Building, Sacramento.
Secretary, Edmund E. Simpson, 1127 Eleventh Street, Sacramento 14.
Meeting, *Third Tuesday, 8:30 p. m., Auditorium, Sacramento.*

San Benito County Medical Society
President, J. M. O'Donnell, Hollister.
Secretary, J. J. Haruff, Hollister.
Meeting, *At Call of President.*

San Bernardino County Medical Society
President, Carl M. Hadley, 315 Platt Building, San Bernardino.
Secretary, Arthur E. Varden, Medico-Dental Building, San Bernardino.
Meeting, *First Tuesday, 8:00 p. m., San Bernardino County Charity Hospital.*

San Diego County Medical Society
President, A. E. Moore, 2120 Fourth Avenue, San Diego 1.
Secretary, W. H. Geistweit, Jr., 810 Medical Building, 233 A Street, San Diego, 1.
Meeting, *Second Tuesday, University Club.*

San Francisco County Medical Society
2190 Washington Street 9
President, Chester L. Cooley, 490 Post Street, San Francisco 2.
Secretary, Robertson Ward, 2180 Washington Street, San Francisco 9.
Meeting, *Second Tuesday, 8:15 p. m., 2180 Washington Street, San Francisco, 9.*

San Joaquin County Medical Society
President, Dora Ames Lee, 110 North San Joaquin Street, Stockton 6.
Secretary, H. D. Chope, Box 111, Stockton.
Meeting, *First Thursday, 8:15 p. m., Medico-Dental Club Rooms, Stockton.*

San Luis Obispo County Medical Society
President, Edward C. Sherman, 784 Marsh Street, San Luis Obispo.
Secretary, G. D. Kelker, 1114 Marsh Street, San Luis Obispo.
Meeting, *Fourth Wednesday, 6:30 p. m., Gold Dragon Cafe, San Luis Obispo.*

San Mateo County Medical Society
President, A. G. Miller, 205 Third Avenue, San Mateo.
Secretary, J. Paul Sweeney, 1149 Rosewood Avenue, San Carlos.
Meeting, *Third Tuesday of each month.*

Santa Barbara County Medical Society
President, Alfred B. Wilcox, 1515 State Street, Santa Barbara.
Secretary, Charles A. Preuss, 1317 Santa Barbara Street, Santa Barbara.
Meeting, *Second Monday, Cottage Hospital.*

Santa Clara County Medical Association
President, Charles A. Fernish, 226 Sainte Claire Building, San Jose 23.
Secretary, Fred W. Borden, Sainte Claire Building, San Jose, 23.

Santa Cruz County Medical Society
President, Ruth A. Frary, 123 East Third Street, Watsonville.
Secretary, Samuel B. Randall, 84 Walnut Avenue, Santa Cruz.
Meetings: *February, April, October, and December. Time and place to be decided by the President.*

Shasta-Trinity County Medical Society
President, L. C. Mosher, Bieber.
Secretary, Julius M. Kehoe, Redding.
Meeting, *Second Monday.*

Siskiyou County Medical Society
President, Richard W. Jones, 106 South Broadway, Yreka.
Secretary, F. W. Martin, Mt. Shasta.
Meeting, *Sunday on Call.*

Solano County Medical Society
President, John W. Green, Box 539, Vallejo.
Secretary, Clark T. Alexander, 731 Sonoma Street, Vallejo.
Meeting, *Second Thursday, 8:00 p. m., Casa de Vallejo; Hotel Vallejo.*

Sonoma County Medical Society
President, William Stegeman, 534 B Street, Santa Rosa.
Secretary, Raimond F. Clary, 1616 Fourth Street, Santa Rosa.
Meeting, *Second Thursday.*

Stanislaus County Medical Society
President, J. Lyle Spellman, P. O. Box 1412, Modesto.
Secretary, Richard R. Treadwell, P. O. Box 801, Modesto.
Meeting, *Second Friday, 7:30 p. m., Hotel Hughson.*

Tehama County Medical Society
President, James L. Faulkner, Red Bluff.
Secretary, R. G. Frey, Red Bluff.
Meeting, *At Call of President.*

Tulare County Medical Society
President, George Keiper, Bank of America Building, Visalia.
Secretary, Irvin H. Betts, 222 West Willow Street, Visalia.

Ventura County Medical Society
President, A. W. Cruden, Saticoy.
Secretary, George H. Arnold, Route 2, Box 12, Ventura.
Meeting, *Second Tuesday, Ventura County Country Club.*

Yolo County Medical Society
President, Charles S. Roller, 604 Woodland Avenue, Woodland.
Secretary, Emery Leivers, Woodland Clinic, Woodland.
Meeting, *First Wednesday.*

Yuba-Sutter-Colusa County Medical Society
President, Leon M. Swift, Box 244, Marysville.
Secretary, D. Ermorene Edwards, 725 Fourth Street, Marysville.
Meeting, *Second Wednesday.*

(For roster of C.M.A. committees and other organization, see last month's issue.)

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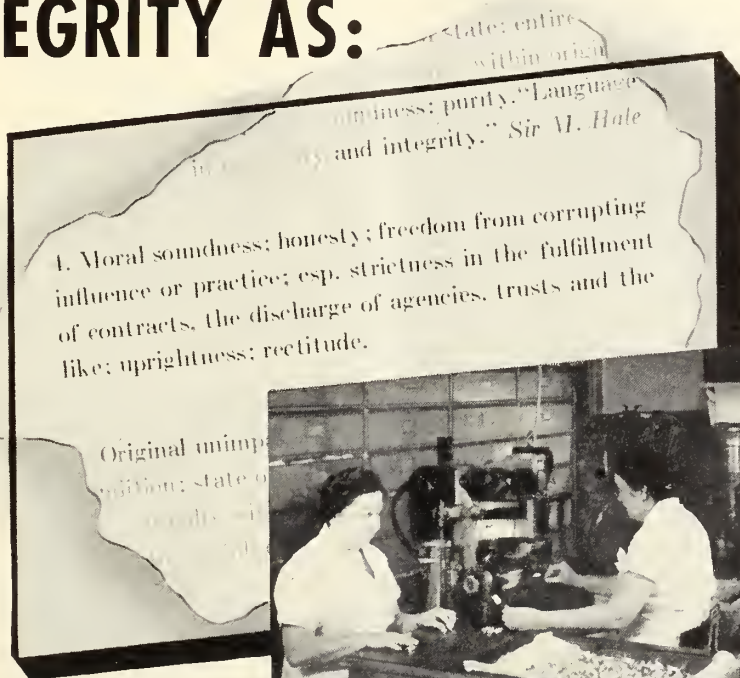
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BOOKS RECEIVED

A Bibliography of Infantile Paralysis With Selected Abstracts and Annotations—1789-1944. Prepared under direction of the National Foundation for Infantile Paralysis, Inc. Edited by Morris Fishbein, M.D., Editor, Journal of the American Medical Association; compiled by Ludvig Hektoen, M.D., Chief Editor, Archives of Pathology and Ella M. Salmonsens, Medical Reference Librarian, John Crerar Library, Chicago. Cloth. Pp. 672. Philadelphia, London, Montreal: J. B. Lippincott Company, 1946.

Human Embryology. By Bradley M. Patten, Professor of Anatomy in the University of Michigan Medical School. Cloth. Price, \$7.00. Pp. 776 with 1366 drawings and photographs grouped as 446 illustrations; 53 in color. Philadelphia: The Blakiston Company, 1946.

Manson's Tropical Diseases—A Manual of the Diseases of Warm Climates. Edited by Philip H. Manson-Bahr, C.M.G., D.S.O., M.A., M.D., D.T.M., and H. Cantab., F.R.C.P., Lond. Senior Physician to the Hospital for Tropical Diseases, London, the Albert Dock Hospital and

the Tilbury Hospital; Consulting Physician to the Colonial Office and Crown Agents for the Colonies; Consultant in Tropical Diseases to the Admiralty and to the Royal Air Force; Director, Division of Clinical Medicine, London School of Hygiene and Tropical Medicine; Lecturer on Tropical Medicine to the London Hospital; Corresponding Member of the Société de Pathologie Exotique; Member of the Washington Academy of Medicine; late Examiner in Tropical Medicine to the Conjoint Board of the Royal College of Physicians and Royal College of Surgeons, England, and to Cambridge and Hongkong Universities. Author (with A. Alock) of "The Life and Work of Sir Patrick Manson," 1927; "The Dysenteric Disorders," 1939 and "Synopsis of Tropical Medicine," 1943. Twelfth Edition. Cloth. Price, \$12.00. Pp. 1068 with 17 color plates, 9 half-tone plates, 406 figures in the text, 6 maps, and 28 charts. A William Wood Book. Baltimore: The Williams and Wilkins Company, 1945.

Through the Stratosphere—The Human Factor in Aviation. By Maxine Davis. Cloth. Price, \$2.75. Pp. 253. New York: The MacMillan Company, 1946.

(Continued on Page 24)

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Penicillin is the best agent available for the treatment of subacute bacterial endocarditis. Daily administration of 200,000 to 300,000 units or, in infections with resistant organisms, much more, in divided doses (every 3 hours) is required. Intramuscular injections are usually the route of choice; however, in certain instances, it may appear desirable to employ continuous drip. Therapy should be continued for a minimum of 3 weeks and must be continued until the blood cultures are consistently negative. Penicillin alone is as effective as penicillin and heparin combined.

Final determination of cure depends upon long-term observation, but if the patient remains asymptomatic and bacteriologically free for a period of 4 weeks after cessation of penicillin therapy, the prognosis for complete cure is excellent. However, it must be remembered that valvular damage and renal lesions are not favorably influenced.

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DAWSON, M. H., AND HUNTER, T. H.: *The Treatment of Subacute Bacterial Endocarditis with Penicillin: Results in Twenty Cases*, J.A.M.A. 127:129 (Jan. 20) 1945. . . FAVOUR, C. B.; JANEWAY, C. A.; GIBSON, J. G., H. AND LEVINE, S. A.: *Progress in the Treatment of Subacute Bacterial Endocarditis*, New England J. Med. 234:71 (Jan. 17) 1946.



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Psychologist—Albert N. Hoxie, M.A.

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CASE HISTORY

Record No. 135
 Name Richard P. Poe
 Address 105 S. Main Street
 Dr. John J. Poe
 FINAL DIAGNOSIS Hemiplegia
 Date June 15, 1946
 FOLLOW UP RECORD Pain in region of infection - improved
 RESULT Recovered — Improved — Unimproved — Died
 PERSONAL: Age 28 Sex Male S. M. W. D. S. M. D. Occupation Accountant
 FAMILY HISTORY: Negative

HABITS: Non

PAST HEALTH: U.S.

PRESENT CONDITION: on rig
rules

PHYSICAL E

TEMP. 9

HEAD: (ir

CASE HISTORY OF AN IDEA ON ICE

While on duty with army in Aleutians, Capt. , medical corps, dreamed up modern office he planned to open when discharged. Overseas several years, so idea had to go on ice. Recently separated from army and eager to thaw out that dream. Needed lift from "G. I. Bill of Rights." Checked with Veterans' Counselor at Bank of America; found that, with government guaranteeing a portion of loan under "G. I. Bill," it was possible to finance that modern office. Convenient monthly payments arranged.

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BOOKS RECEIVED

(Continued from Page 20)

Autopsy Diagnosis and Technique. By Otto Saphir, M.D., Pathologist, Michael Reese Hospital; Professor of Pathology, University of Illinois Medical School, Chicago. Foreword by Ludvig Hektoen, M.D. Second edition, revised and enlarged. Leather, Pp. 405, illustrated, New York, London: Paul B. Hoeber, Inc., Medical Book Department of Harper and Brothers, 1946.

Narcotics and Drug Addiction. By Erich Hesse, M.D. Cloth. Price, \$3.75. Pp. 219. New York: The Philosophical Library, 1946.

A Textbook of Gynecology. By Arthur Hale Curtis, M.D., Professor and Chairman of the Department of Obstetrics and Gynecology, Northwestern University Medical School; Chief of Gynecological Service, Passa-

vant Memorial Hospital, Chicago. Cloth. Fifth edition with 455 illustrations, chiefly by Tom Jones, including 36 in color. Pp. 755. Philadelphia and London: W. B. Saunders Company, 1946.

Preoperative and Postoperative Treatment. Edited by Lt. Col. Robert L. Mason, M.C., A.U.S., Cushing General Hospital, Framingham, Massachusetts, and Harold A. Zintel, M.D., Harrison Department of Surgical Research, University of Pennsylvania School of Medicine; Assistant Surgeon, Hospital of the University of Pennsylvania. Second edition. Illustrated. Cloth. Pp. 584. Philadelphia and London: W. B. Saunders Company, 1946.

Diseases of the Skin For Practitioners and Students. By George Clinton Andrews, A.B., M.D., Associate Clinical Professor of Dermatology, the College of Physicians and

(Continued on Page 28)

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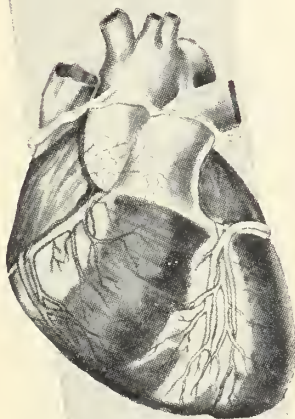
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¹ Gold, H.; Cattell, M.; Modell, W.; Kwit, N. T.; Kramer, M. L., and Zahm, W.: J. Pharmacol. & Exper. Therap. 82:187 (Oct.) 1944.

² Gold, H.: Connecticut M. J. 9:193 (Mar.) 1945.

³ Levine, S. A.: Clinical Heart Disease, ed. 3, Philadelphia, Pa., W. B. Saunders Company, 1945, p. 273.

Physicians are invited to send for samples, literature, and bibliography.



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BOOKS RECEIVED

(Continued from Page 24)

Surgeons, Columbia University; Chief of Clinic, Department of Dermatology, Vanderbilt Clinic; Chief of Dermatology Clinic, Roosevelt Hospital; Attending Dermatologist to Presbyterian Hospital and Roosevelt Hospital; Consulting Dermatologist and Syphilologist to Tarrytown Hospital, Grasslands Hospital, Valhalla, St. Johns Hospital, Yonkers, Greenwich Hospital and the Beekman-Downtown Hospital; Fellow of the American Medical Association, of the American College of Physicians, and the New York Academy of Medicine; Member of the American Dermatological Association, the American Radium Society, the New York Dermatological Society, New York Roentgen Society, and the Manhattan Dermatological Society; Member of the Deutsche Dermatologische Gesellschaft and Corresponding Member of the Société Française de Dermatologie et de Syphiligraphie. Third edition with 971 illustrations. Cloth. Philadelphia and London: W. B. Saunders Company, 1946.

NEWS AND NOTES

(Continued from Text Section Page 39)

Prescriptions and sick room supplies needed by California veterans in treatment of service-incurred disabilities will be made available to them without charge through neighborhood pharmacies under a plan now being worked out between the Veterans' Administration and state pharmaceutical associations. The service will be along the lines of the arrangement now in effect with California Physicians' Service under which veterans can get treatment for service-incurred maladies by physicians of their choice in their own communities.

Recommendations for a broadened cancer control program are contained in a report prepared by a com-

(Continued on Page 32)



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NEWS AND NOTES

(Continued from Page 28)

mittee of the National Advisory Cancer Council and
released by the United States Public Health Service.

The report recommends:

1. More comprehensive and better integrated courses in cancer at medical schools.
2. An increase in the number of centers prepared to give post-graduate training in cancer.
3. Continuation and expansion of the various kinds of cancer education activities for practicing physicians that have been conducted in a number of communities.
4. Aid by the National Cancer Institute in develop-

ment of a few cancer centers strategically located geographically, associated with one or more medical centers, and available to any patient regardless of ability to pay, these centers to serve as guides in development of similar centers anywhere in the country.

5. Expansion in research work of the National Cancer Institute, including training of research fellows and the program of grants to aid research in other institutions.

6. Assistance from the Institute to state health departments and other agencies in developing programs for making adequate cancer service available.

7. Action for additional legislation, where necessary, to give the National Cancer Institute authority to carry out the committee's recommendations.

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1. Florida Health Notes 37, May, 1945.
2. Am. J. Dis. Child. 54:1227, 1937.



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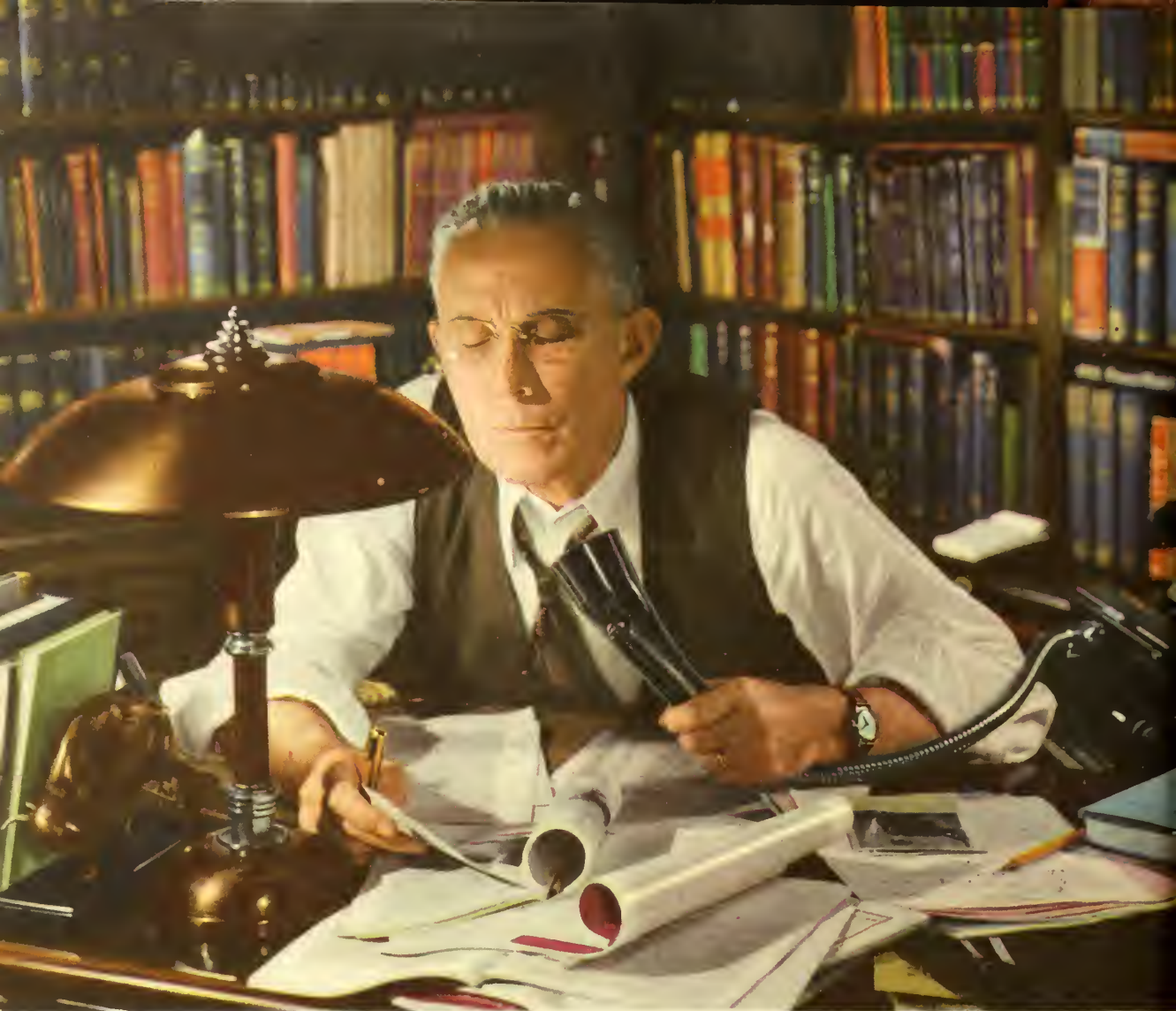
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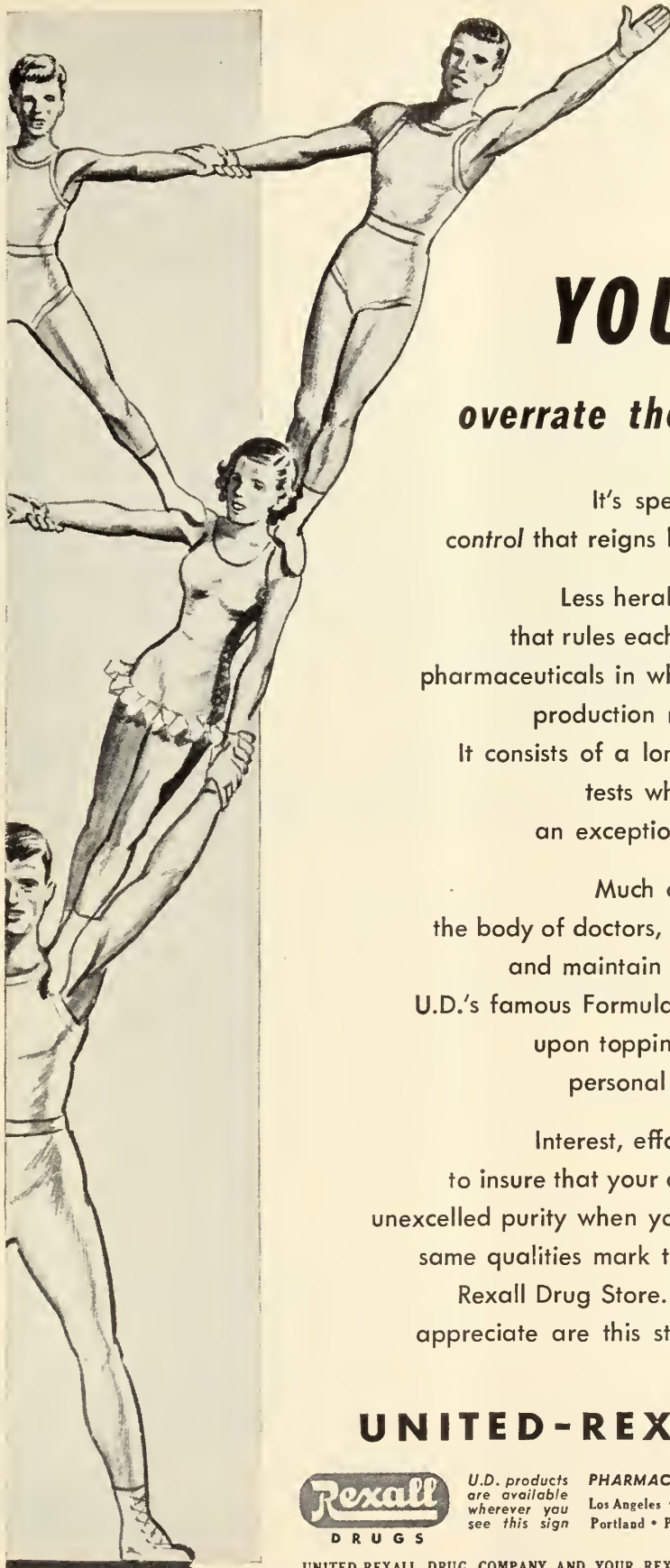
THERE is little rest for the busy physician even after the responsibilities to his patients have been satisfactorily discharged. Medical journals subsist entirely on the writings of physicians. The articles, designed for the purpose of sharing knowledge with others, require arduous toil, and time not available during office hours. It is well to remember then, in reading medical journal papers, that some physician somewhere may have worked far into the night with the hope that his colleagues would benefit.

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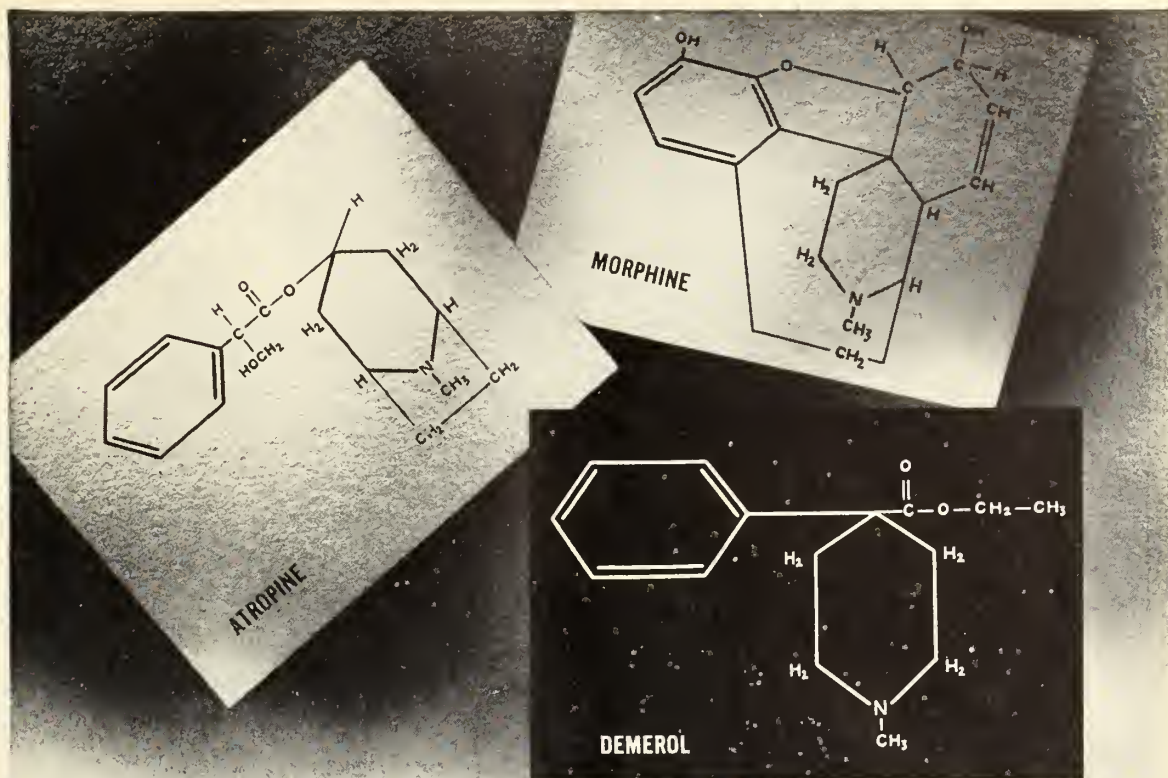
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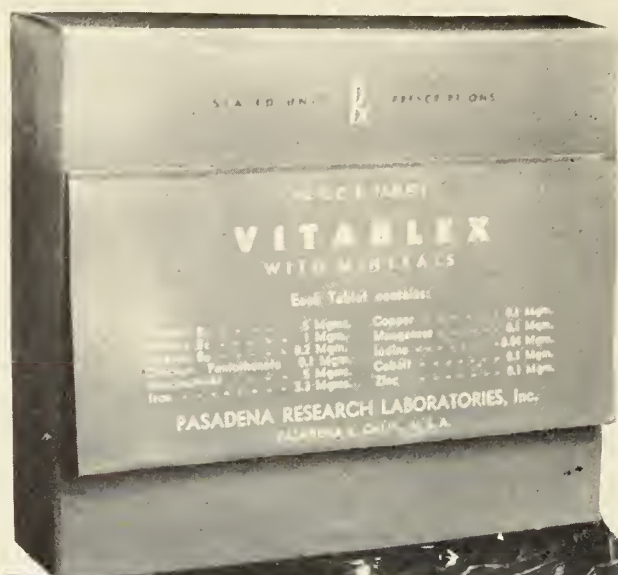
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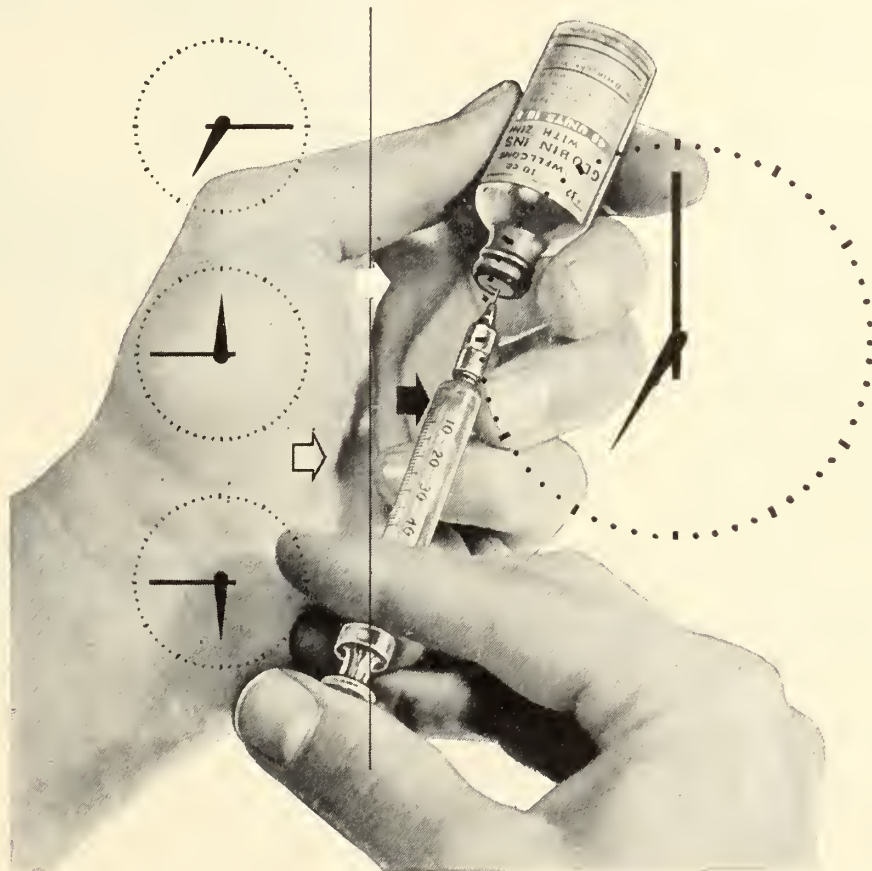
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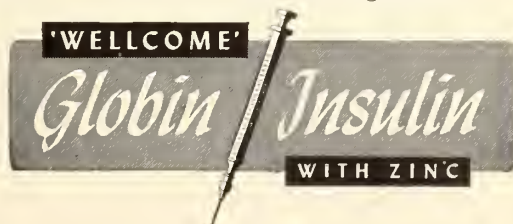
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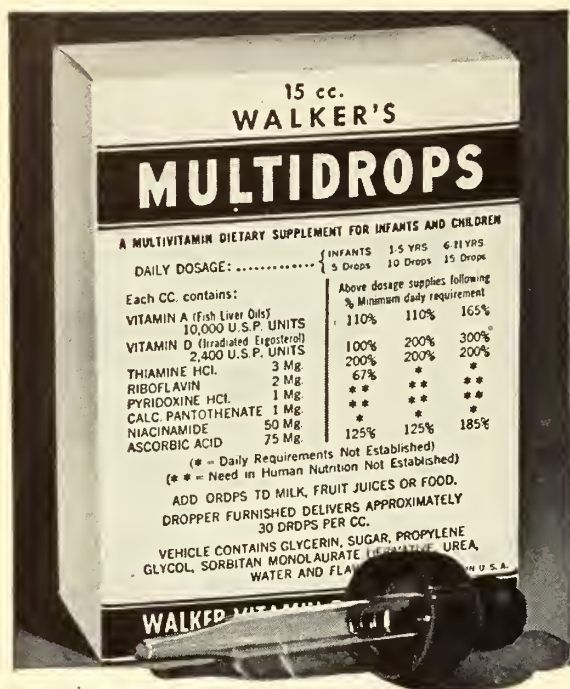
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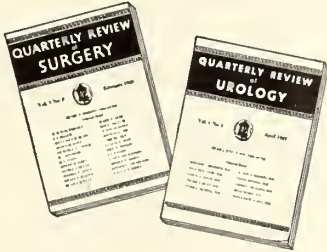
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OFFICIAL JOURNAL
OF THE CALIFORNIA MEDICAL ASSOCIATION

AUGUST, 1946

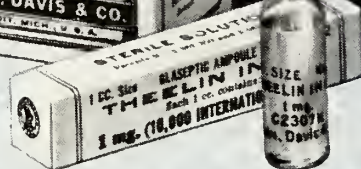
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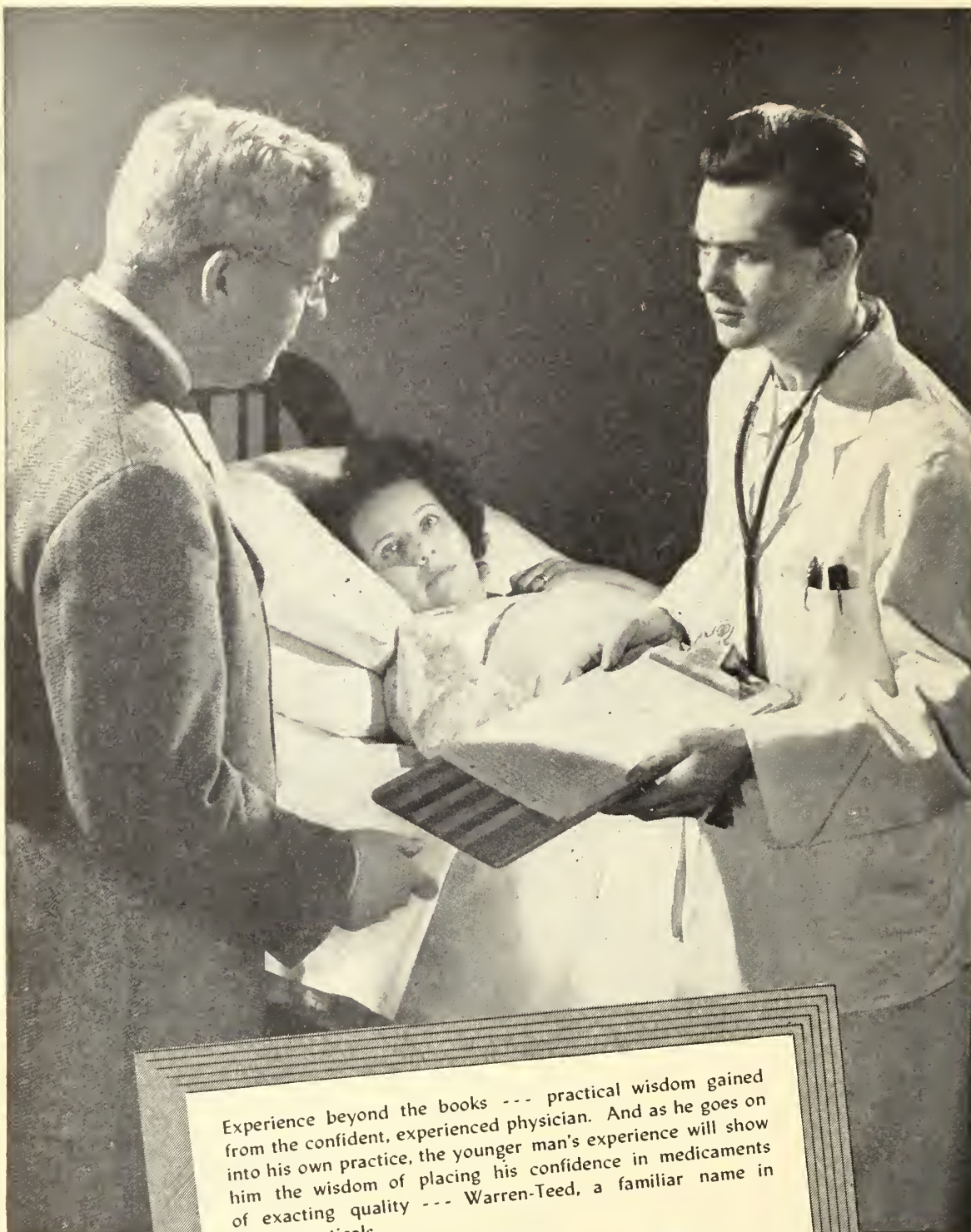
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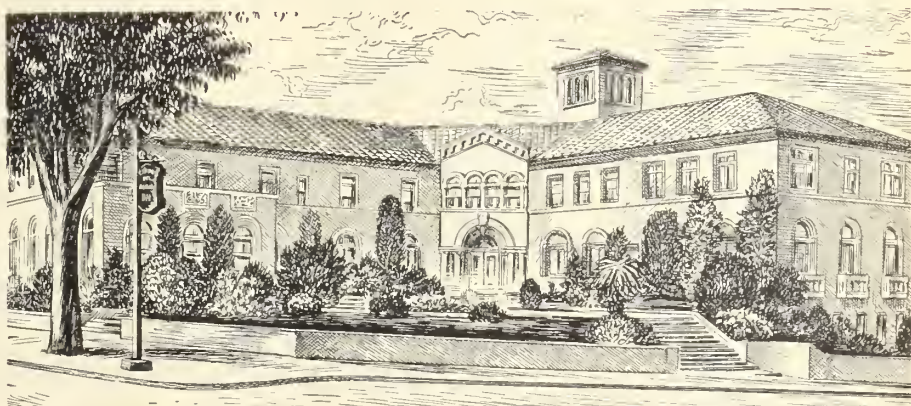
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Brandt, Franz Henry. Died at Pasadena, July 4, 1946, age 73. Graduate of Northwestern University Medical School, Chicago, Illinois, 1901. Licensed in California in 1921. Doctor Brandt was a Retired Member of the Los Angeles County Medical Association, the California Medical Association, and an Affiliate Fellow of the American Medical Association.



Sneden, Claude M. Died at Long Beach, May 21, 1946, age 65. Graduate of the Baltimore Medical College, Maryland, 1904. Licensed in California in 1920. Doctor Sneden was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.



Soiland, Albert. Died at Stavanger, Norway, May 15, 1946 age 73. Graduate of the University of Southern California School of Medicine, Los Angeles, 1900. Licensed in California in 1901. Doctor Soiland was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.



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6-11 months....	4.6	11.8	35.5	77	26	33
1 year.....	4.5	11.2	35.0	78	25	32
3 years.....	4.5	12.5	36.0	80	27	35
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Lennox, W. G. (1945), *Petit Mal Epilepsies: Their Treatment with Tridione*, *J. Amer. Med. Assn.*, 129:1069, December 15.

DeJong, R. N. (1946), *Effect of Tridione in the Control of Psychomotor Attacks*, *J. Amer. Med. Assn.*, 130:565, March 2.

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That PHILIP MORRIS are less irritating to the nose and throat is not merely a claim. It is the result of a manufacturing difference *proved** advantageous over and over again.

But why not make your *own* tests? Why not *try* PHILIP MORRIS on your patients who smoke, and *confirm* the effects for yourself.

* *Laryngoscope*, Feb. 1935, Vol. XLV, No. 2, 149-154
Laryngoscope, Jan. 1937, Vol. XLVII, No. 1, 58-60

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TO PHYSICIANS WHO SMOKE A PIPE:

We suggest an unusually fine new blend—COUNTRY DOCTOR PIPE MIXTURE. Made by the same process as used in the manufacture of Philip Morris Cigarettes.

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For the Diagnosis and Treatment of Nervous and Mental Illness.

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For the Education and Psychiatric Treatment of Children of Average and Superior Intelligence. Boarding Home Facilities.

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THE POTTENGER SANATORIUM and CLINIC

For Diseases of the Chest

Monrovia, California

AN INSTITUTION FOR DIAGNOSIS AND THERAPY

(Established 1903)

CHOICE rooms and bungalows. Rates moderate and include routine medical and nursing services, interim physical, X-ray and laboratory examinations, ordinary medicines and pneumothorax. A charge is made for the first complete examination.

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Close medical supervision. Aside from tuberculosis, special attention is given to asthma, bronchiectasis, lung abscess and kindred diseases. Separate institution for children.

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So Be Sure, Doctor
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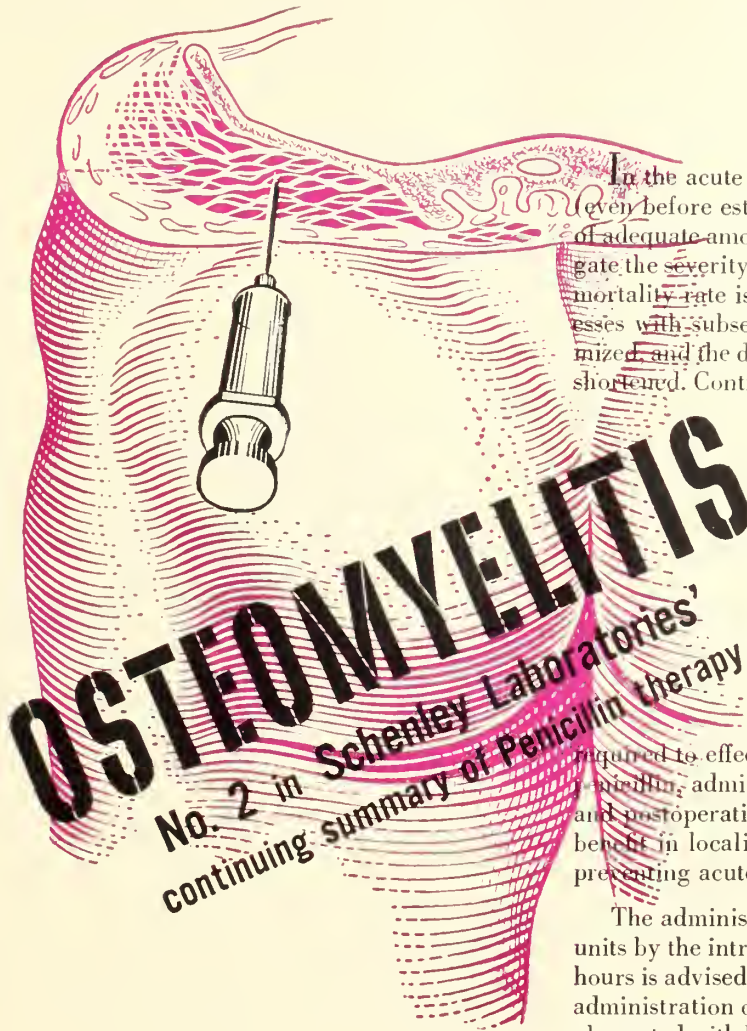
When dealing with THE BUREAU (D.B.B.) you can be assured you get your full share of every penny of INTEREST collected on the past due accounts you refer for collection. You will find this is not a universal custom of collection agencies. GET WHAT YOU PAY FOR!



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In the acute form, early administration (even before establishment of the diagnosis) of adequate amounts of penicillin will mitigate the severity of the infection. Hence, the mortality rate is reduced, destructive processes with subsequent deformity are minimized, and the duration of the disease is shortened. Control and eradication of the

infection may be obtained without major surgical intervention; however, surgical removal of necrotic bone will be required in some instances and abscesses should be either aspirated or incised and drained.

In the chronic form, major surgery is usually required to effect a cure; however, penicillin, administered both preoperatively and postoperatively, is of inestimable benefit in localizing the infection and preventing acute exacerbations.

The administration of 20,000 to 40,000 units by the intramuscular route every 2 to 4 hours is advised. When necessary, parenteral administration of penicillin should be supplemented with local instillations of 25,000 to 50,000 units in a sterile solution two to three times daily. Due attention must be paid to surgical, supportive, and other measures when these are indicated.

To determine complete control and eradication of the infection, a prolonged follow-up period with frequent physical examinations and serial roentgenograms is advised.

BEFORE YOU DECIDE ON THE PENICILLIN OF YOUR CHOICE

Consider this important fact: For many years, Schenley has been among the world's largest users of research on mycology and fermentation processes... from which penicillin and certain other antibiotics are derived. The wide scope of our activities in these fields is your assurance that when you choose Penicillin Schenley you choose a product thoroughly tested for potency and quality.

PENICILLIN SCHENLEY

a product of

SCHENLEY LABORATORIES, INC. Executive Offices: 350 Fifth Avenue, N. Y. C.

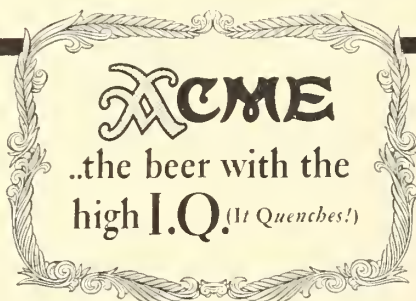
KEEFER, C. S. *Penicillin—Its Present Status in the Treatment of Infections: The Nathan Hatfield Lecture XXIX, Am. J. Med. Sc. 210:147 (Aug.) 1945.*

ALTEMEIER, W. A.: *Treatment of Acute Hematogenous Osteomyelitis with Penicillin, Ohio State M. J. 42:439 (May) 1946.*

NO WHEAT USED IN ACME BEER

Today, wheat is needed to feed the world's hungry people. Although wheat has never been a large item in the brewing process, Acme Breweries has used *no wheat whatever* since the food crisis arose in March. All of us—every American—can help during this emergency by cooperating with these three recommendations from the President's Famine Emergency Committee:

1. Cut down on wheat products $\frac{1}{3}$; on fats and oils $\frac{1}{4}$.
2. Buy and serve the more plentiful foods.
3. Waste **NO** food.



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As of July 1st the San Francisco Surgical Co. purchased the Walters Surgical Company's San Francisco Store. Although the ownership has changed hands, the management remains the same and, as far as possible, we are endeavoring to keep the same personnel.

Our friends and customers can be assured of a continuance and, as far as possible, improvement, of our good service.

Quality merchandise at reasonable prices will be our goal and we solicit the business of Physicians and Surgeons in Northern California on this basis.

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Three technically schooled, fully experienced contact lens technicians; contact lens laboratories at 366 Post Street, San Francisco, and 1904 Franklin Street, Oakland.

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SALINAS: Salinas National Bank Building



CHANGES IN MEMBERSHIP

(Continued from Page 18)

Hedge, Arden, *Redwood City*McLaughlin, Richard F., *Burlingame*Morrison, Gordon, *Burlingame*Sherwood, Robert O., *Burlingame**Santa Barbara County (1)*Pierce, Harrison M., *Santa Barbara**Shasta County (1)*Mackintosh, William A., *Shasta*

Transfers (16)

Fitzgibbon, J. Paul, from *Los Angeles County* to *Alameda County*Gottlieb, Jacob D., from *Mendocino-Lake County* to *Los Angeles County*Harrington, Harrel Lee, from *San Francisco County* to *Alameda County*Johnson, Malcolm C., from *Solano County* to *San Mateo County*Kaess, James B., from *Contra Costa County* to *Alameda County*King, Robert W., from *Santa Clara County* to *Alameda County*Meilstrup, Drew B., from *San Francisco County* to *Los Angeles County*Moore, Ferrall H., from *Santa Clara County* to *San Mateo County*Offield, Leonard D., from *San Francisco County* to *San Mateo County*Ornduff, William W., from *Yuba-Sutter-Colusa County* to *Alameda County*

(Continued in Back Advertising Section, Page 40)

**Las Encinas Sanitarium Pasadena, California**

INTERNAL MEDICINE INCLUDING FUNCTIONAL AND ORGANIC NERVOUS SYSTEM DISEASES

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Address: STEPHEN SMITH, M.D., F.A.C.P.; CHARLES W. THOMPSON, M.D., F.A.C.P.

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GREATER BACTERIAL ACTIVITY in hot weather increases the likelihood of food contamination. That means more cases of vomiting and diarrhea, attended by dehydration and acidosis. The solution of choice in these conditions is frequently

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NEW—1/6 Molar booklet, digesting authoritative papers on uses of this very valuable solution, will be sent you promptly, without obligation, upon request.

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Effective Urogenital Analgesia in Urologic Surgical Procedures and Diagnostic Instrumentation

SURFACE anesthesia of the urogenital mucosa equal to that obtained with procaine may be achieved with Pyridium.

This action of Pyridium, which is entirely free from undesirable side-effects, provides the physician with a convenient and effective means of producing preoperative and postoperative surface and wound analgesia, in urologic surgical procedures and diagnostic instrumentation.

Acting directly on the mucosa of the urogenital tract, this effect of Pyridium is entirely local. It is not associated with or due to systemic sedation or narcotic action.

The lack of toxicity characteristic of Pyridium permits its administration virtually without consideration of toxic effects.

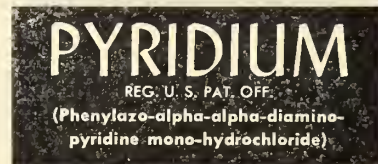
Pyridium imparts an orange-red color to the urine. It also temporarily stains the urogenital mucosa, which may at times make it more difficult to detect inflammatory and other changes.

For cystoscopy, cystoscopic diagnostic procedures, and for urethral medication, one ounce of Pyridium Solution is injected into the urethra and bladder and held in place with the urethral clamp for a 10-minute period. The solution then is released and a repeat injection of 15 cc. is made and retained for 5 minutes.

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REG. U. S. PAT. OFF.

(Phenylazo-alpha-alpha-diamino-
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For gratifying relief of
distressing symptoms in
urogenital infections.

COSEASONAL TREATMENT OF

Worthwhile relief can be obtained in a large percentage of pollinosis cases if hyposensitization treatment is begun on manifestation of symptoms.

Coseasonal treatment offers the added benefit of helping to establish the patient's tolerance to the

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CONVENIENCE AND SIMPLICITY

The *Arlington* POLLEN TREATMENT SET is designed to conveniently facilitate hyposensitization. Each treatment set contains five 3-cc. vials of graduated dilutions (1:10,000, 1:5,000, 1:1,000, 1:500, and 1:100) of pollen antigen, especially prepared to cover the patient's individual pollen sensitivities.



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'MERTHIOLATE' (Sodium Ethyl Mercuri Thiosalicylate, Lilly) exerts its germicidal action without interfering with normal defenses of the body. 'Merthiolate' produces dependable asepsis and is noted for its general clinical applicability.

It has measured up to the most critical requirements of the medical profession, and is an antiseptic of choice among many discerning physicians and surgeons.

Among the preparations of 'Merthiolate' now used extensively is the tincture.

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Smallpox Vaccine bearing the Lilly Label is prepared by the most approved methods and under ideal conditions. Each step of preparation, from the first inspection of the animal to the final bacteriological, microscopical, and physiological tests, is performed with meticulous care. Every precaution is exercised to provide the physician with a safe and efficient vaccine. Smallpox Vaccine, Lilly, is worthy of the name it bears. Available through prescription stores everywhere.

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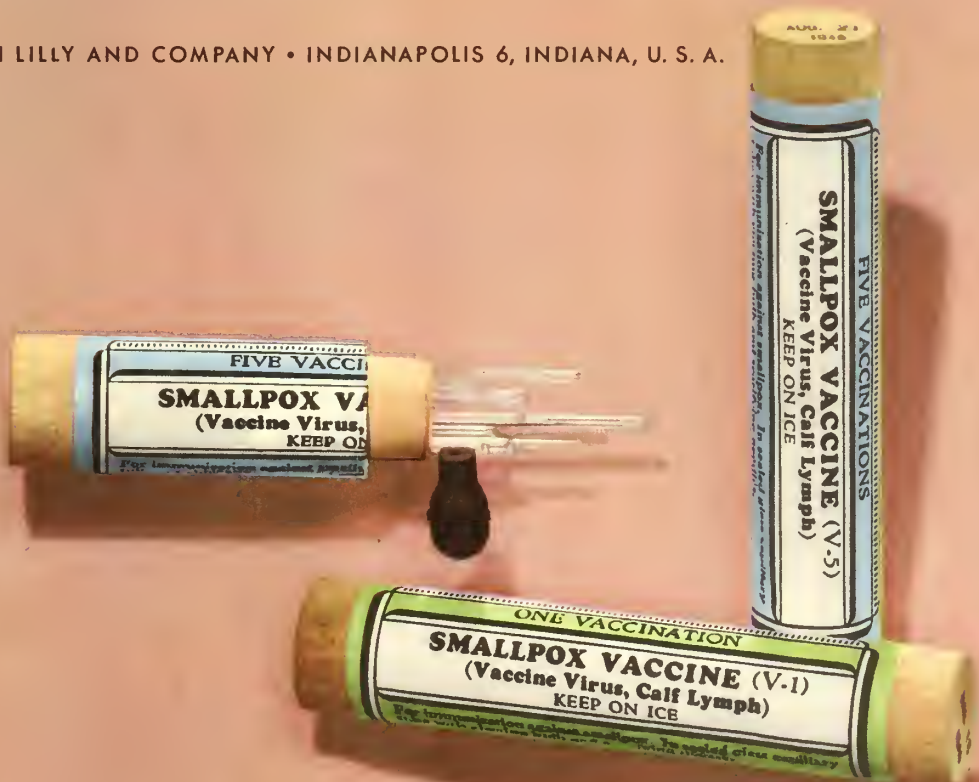




ILLUSTRATION BY HERMAN GIESEN

For the common good

TIRED AND WORN by the demands of the busy day, the average physician would much prefer home and family to an evening meeting of his medical society. He would like nothing better than a few hours of complete rest and relaxation. Medical progress, however, demands that he be ever alert. Or if he happens upon an experience which may be helpful to others, he willingly shares it. Advancement in medical practice must be common knowledge in order that people in general may benefit.

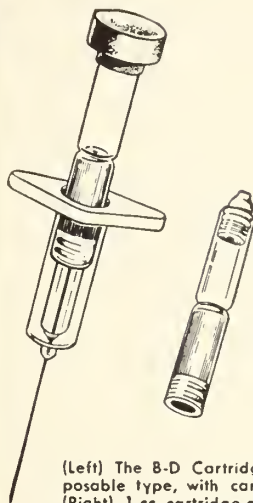
So, also, has manufacturing pharmacy advanced from the weird phantasy of the alchemist to its present scientific position. No longer are there secrets in chemistry or the allied sciences. New laboratory developments quickly become common knowledge, available to all who have the facilities to turn them to practical account. Eli Lilly and Company long has been a leader in fundamental and applied research, and has been privileged to co-operate in the development of many important discoveries.

A picture of *The Good Samaritan* provided the inspiration that



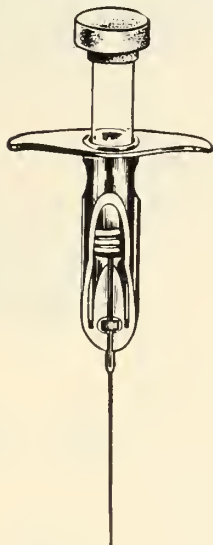
eventually led to the founding of Eli Lilly and Company

Announcing Easier Administration of Penicillin in Oil and Wax



(Left) The B-D Cartridge Syringe, disposable type, with cartridge inserted.
(Right) 1 cc. cartridge of penicillin in oil and wax.

The B-D Metal Cartridge Syringe with cartridge inserted.



Bristol Laboratories now introduce two techniques which are designed to make the administration of penicillin easier and more practical. Both of them make use of a 1 cc. glass cartridge of Penicillin in Oil and Wax. A completely new feature of the Bristol Cartridge is a specially designed rubber stopper which permits an aspirating test to prevent venoclysis.

Bristol Cartridges may be used anywhere, any time with the B-D Cartridge Syringe, Disposable Type. (Above) For office or hospital, many physicians will prefer the B-D Metal Cartridge Syringe. (Left)

In addition to the 1 cc. cartridges, Bristol Penicillin in Oil and Wax is still available in 10 cc. rubber-stoppered vials, for those who prefer to employ a Luer-lock syringe. All forms are available through your regular source of supply.

PENICILLIN IN OIL AND WAX BRISTOL

(Romansky Formula)

BRISTOL

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You offer your patients only one kind of skill—the best of your ability. We give your patients only one kind of prescription service—the best in precision workmanship and quality materials. When you entrust your prescriptions to us, you know that every detail will be correctly finished for complete patient satisfaction.

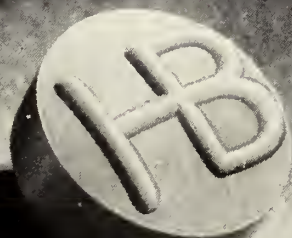
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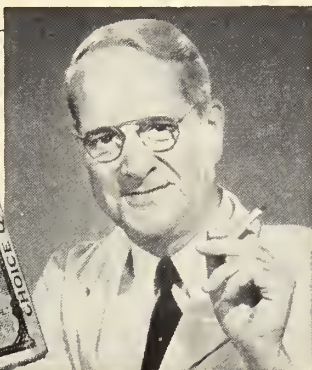
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Marie Williams, Director



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have been found very effective in breaking the impulse of the rectal muscle to keep itself locked. Sold only by prescription. Obtainable at your surgical supply house; available for patients at ethical drug stores. Set of 4 guaranteed sizes, adult \$4.75; children, \$4.50. Write for Brochure.

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ALLERGENIC EXTRACT RAGWEED POLLENS

(Mixed)

For Individualized Treatment

★ **PITMAN-MOORE** Ragweed Pollen Extract is presented in a specially designed individual treatment package, which permits the dosage to be adjusted to individual sensitivity, a method definitely better than giving every patient the same dosage. The stability of this allergen is intensified by the use, in its production, of a special glycono-saline menstruum which insures full potency beyond the expiration date.

● **PROPHYLAXIS**—Injections may be started 3 weeks or more before expected first symptoms.

● **CO-SEASONAL TREATMENT**—Applicable following or in lieu of pre-seasonal prophylaxis.

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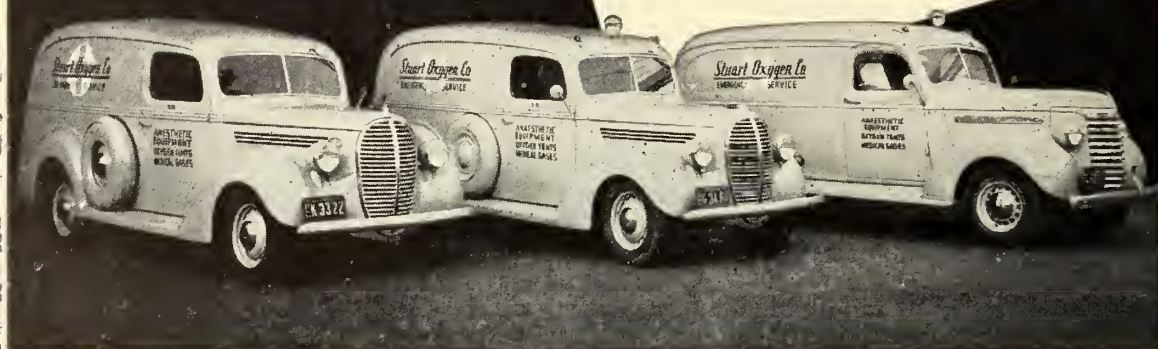
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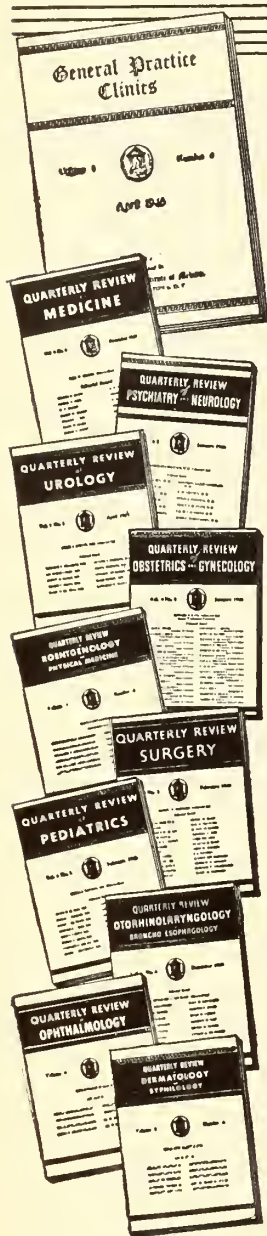
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Editorially, *General Practice Clinics* is truly remarkable. Its board of editors comprises no less than eighty world-famous authorities, representing forty-three leading universities, clinics and hospitals; and they serve, without remuneration, on the editorial board as a means of contributing to medical progress. This distinguished board is largely responsible for the international reputation attained in less than five years by *General Practice Clinics*.

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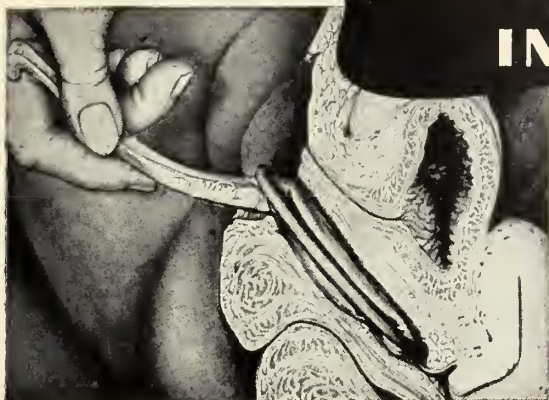
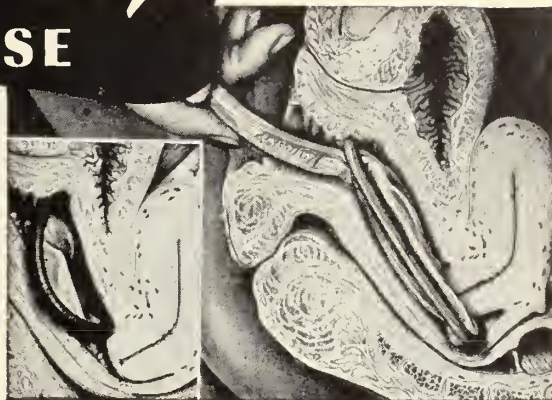
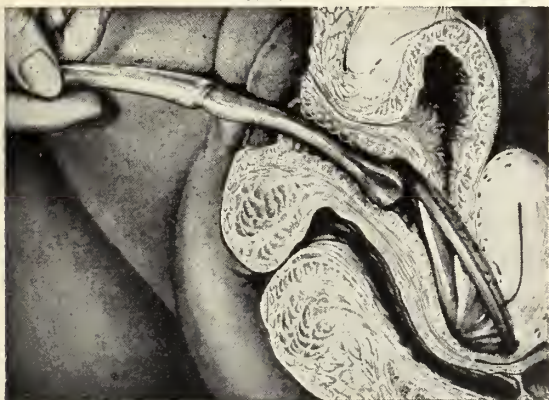
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FOLLOW UP RECORD

Pain in region of
infarction - improvedRESULT RecoveredImproved — Unimproved — DiedOccupation AccountantPERSONAL: Age 28Sex Male

M. W. D.

FAMILY HISTORY: NegativeHABITS: NonePAST HEALTH: GoodPRESENT CONDITION: on right side

PHYSICAL EXAMINATION:

TEMP: 98.6

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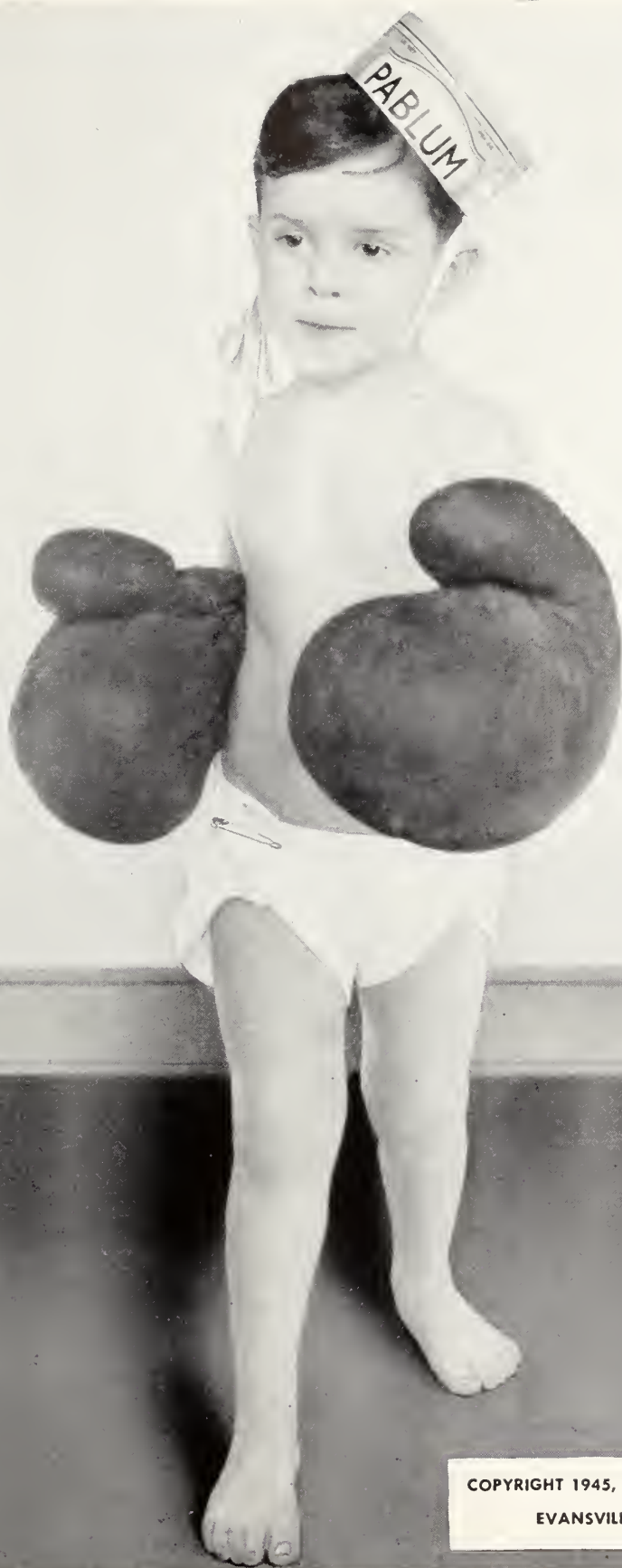
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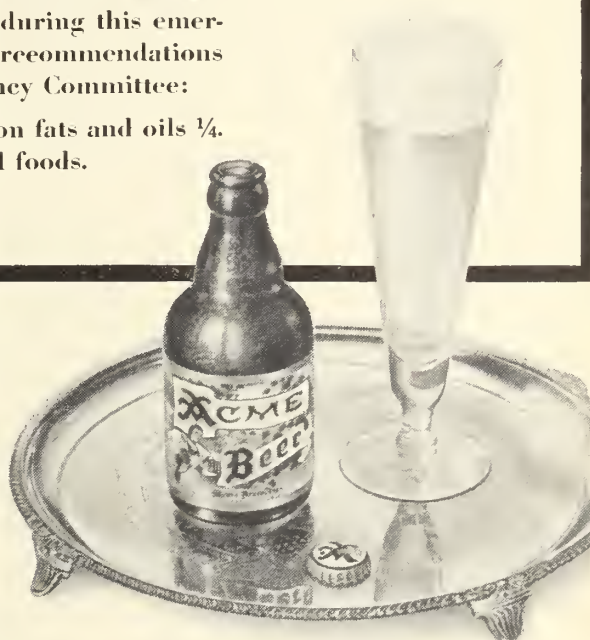
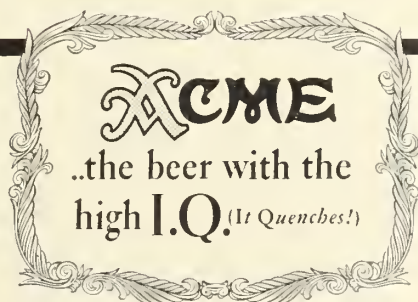
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ROSTER OF COUNTY MEDICAL SOCIETIES. CALIFORNIA MEDICAL ASSOCIATION

(County society secretaries are requested to notify "California Medicine" promptly when changes are indicated in their roster information.)

Alameda County Medical Association
364 14th Street, Oakland 12
President, Warren B. Allen, 411 30th Street, Oakland 9.
Secretary, Dorothy M. Allen, 2923 Webster Street, Oakland 9.
Meeting, *Third Monday, 8:15 p. m., Hunter Hall, Oakland.*

Butte-Glenn County Medical Society
President, Hollis L. Carey, 567 Kentucky Street, Gridley.
Secretary, J. O. Chiapella, 131 Broadway, Chico.
Meeting, *Second Thursday.*

Contra Costa County Medical Society
President, George Kelso, 416 E. Fourth Street, Pittsburg.
Secretary, H. D. Neufeld, Box 338, Concord.
Meeting, *Second Tuesday, 8:00 p. m.*

Fresno County Medical Society
President, J. A. Thormann, Box 1908, Fresno.
Secretary, William L. Adams, Jr., 515 Helm Building, Fresno.
Meeting, *First Tuesday, University-Sequoia Club, Fresno.*

Humboldt County Medical Society
President, Walter Dolfini, 539 G Street, Eureka.
Secretary, Wayne P. McKee, Ferndale.
Meeting, *First Thursday.*

Imperial County Medical Society
President, Charles Cutshaw, Brawley.
Secretary, George Cole, Brawley.
Meeting, *Third Tuesday, 7:00 p. m., Barbara Worth Hotel, El Centro.*

Inyo-Mono County Medical Society
President, Walter L. Wilson, 108 N. Main, Bishop.
Secretary, Lloyd S. Bambauer, Bishop.
Meeting, *Fourth Wednesday, except December, January, February.*

Kern County Medical Society
President, William H. Macdonald, 2103 18th Street, Bakersfield.
Secretary, Frederick O. Wynia, 354 Habersfelde Building Bakersfield.
Meeting, *Third Tuesday, 7:30 p. m., Stockdale Country Club, except June, July, August.*

Kings County Medical Society
President, Lionel W. Sorenson, 1118 Whitley Avenue, Corcoran.
Secretary, William F. Chamlee, Van Sicken Building, Hanford.
Meeting, *Second Monday, 8:00 p. m., Legion Hall, Hanford.*

Lassen-Plumas-Modoc County Medical Society
President, Wilbur C. Batson, Greenville.
Secretary, John Paul McKenney, Alturas.
Meeting, *On Call.*

Los Angeles County Medical Association
1925 Wilshire Boulevard, Los Angeles 5
President, Louis J. Regan, 6777 Hollywood Boulevard, Los Angeles 28.
Secretary, E. T. Remmen, 429 North Orange, Glendale 3.
Meeting, *First and Third Thursday, 1925 Wilshire Boulevard, Los Angeles.*

Marin County Medical Society
President, Lloyd G. Tyler, 1010 B Street, San Rafael.
Secretary, Carl W. Clark, 1010 B Street, San Rafael.
Meeting, *Fourth Thursday, 7:00 p. m., Travelers Inn, San Rafael.*

Mendocino-Lake County Medical Society
President, J. E. Gardner, 216 W. Standley Street, Ukiah.
Secretary, E. C. Bennett, Ukiah.

Merced County Medical Society
President, E. R. Fountain, Merced.
Secretary, C. C. Fitzgibbon, Shaffer Building, Merced.
Meeting, *Third Thursday, Hotel Tioga, Merced.*

Monterey County Medical Society
President, Margaret Swigert, Professional Building, Monterey.
Secretary, W. A. Carnazzo, M.D., 411 Alvarado Street, Monterey.
Meeting, *First Thursday.*

Napa County Medical Society
President, Charles H. Bulson, 1203 Seminary Street, Napa.
Secretary, M. M. Booth, Bruck Building, St. Helena.
Meeting, *First Wednesday.*

Orange County Medical Association
President, John Montanus, Rt. 1, Box 587A, Santa Ana.
Secretary, Russell I. Johnson, 181 Westminster Boulevard, Westminster.
Meeting, *First Tuesday, 7:00 p. m., Windsor Cafe, Santa Ana.*

Placer-Nevada-Sierra County Medical Society
President, George A. Foster, Grass Valley.
Secretary, Vernon W. Padgett, Grass Valley.
Meeting, *At Call of President.*

Riverside County Medical Society
President, Franklin D. Hankins, 3014 Pine Street, Riverside.
Secretary, N. K. Bear, 3655 Fourteenth Street, Riverside.
Meeting, *Second Monday, 8:00 p. m., Library, Riverside Community Hospital.*

Sacramento Society for Medical Improvement
President, Frank Reardon, Physicians Building, Sacramento.
Secretary, Edmund E. Simpson, 1127 Eleventh Street, Sacramento 14.
Meeting, *Third Tuesday, 8:30 p. m., Auditorium, Sacramento.*

San Benito County Medical Society
President, J. M. O'Donnell, Hollister.
Secretary, J. J. Haruff, Hollister.
Meeting, *At Call of President.*

San Bernardino County Medical Society
President, Carl M. Hadley, 315 Platt Building, San Bernardino.
Secretary, Arthur E. Varden, Medico-Dental Building, San Bernardino.
Meeting, *First Tuesday, 8:00 p. m., San Bernardino County Charity Hospital.*

San Diego County Medical Society
President, A. E. Moore, 2120 Fourth Avenue, San Diego 1.
Secretary, W. H. Geistweit, Jr., 810 Medical Building, 233 A Street, San Diego.
Meeting, *Second Tuesday, University Club.*

San Francisco County Medical Society
2190 Washington Street 9
President, Chester L. Cooley, 490 Post Street, San Francisco 2.
Secretary, Robertson Ward, 2180 Washington Street, San Francisco 9.
Meeting, *Second Tuesday, 8:15 p. m., 2180 Washington Street, San Francisco, 9.*

San Joaquin County Medical Society
President, Dora Ames Lee, 110 North San Joaquin Street, Stockton 6.
Secretary, H. D. Chope, Box 111, Stockton.
Meeting, *First Thursday, 8:15 p. m., Medico-Dental Club Rooms, Stockton.*

San Luis Obispo County Medical Society
President, Edward C. Sherman, 784 Marsh Street, San Luis Obispo.
Secretary, G. D. Kelker, 1114 Marsh Street, San Luis Obispo.
Meeting, *Fourth Wednesday, 6:30 p. m., Gold Dragon Cafe, San Luis Obispo.*

San Mateo County Medical Society
President, A. G. Miller, 205 Third Avenue, San Mateo.
Secretary, J. Paul Sweeney, 727 Cordilleros Avenue, San Carlos.
Meeting, *Third Tuesday of each month.*

Santa Barbara County Medical Society
President, Alfred B. Wilcox, 1515 State Street, Santa Barbara.
Secretary, Charles A. Preuss, 1317 Santa Barbara Street, Santa Barbara.
Meeting, *Second Monday, Cottage Hospital.*

Santa Clara County Medical Association
President, Charles A. Fernish, 226 Salnte Clare Building, San Jose 23.
Secretary, Fred W. Borden, Sainte Claire Building, San Jose, 23.

Santa Cruz County Medical Society
President, Ruth A. Frary, 123 East Third Street, Watsonville.
Secretary, Samuel B. Randall, 84 Walnut Avenue, Santa Cruz.
Meetings, *February, April, October, and December. Time and place to be decided by the President.*

Shasta-Trinity County Medical Society
President, L. C. Mosher, Bieber.
Secretary, Julius M. Kehoe, Redding.
Meeting, *Second Monday.*

Siskiyou County Medical Society
President, Richard W. Jones, 106 South Broadway, Yreka.
Secretary, F. W. Martin, Mt. Shasta.
Meeting, *Sunday on Call.*

Solano County Medical Society
President, John W. Green, Box 539, Vallejo.
Secretary, Clark T. Alexander, 731 Sonoma Street, Vallejo.
Meeting, *Second Thursday, 8:00 p. m., Casa de Vallejo; Hotel Vallejo.*

Sonoma County Medical Society
President, William Stegeman, 534 B Street, Santa Rosa.
Secretary, Raimond F. Clary, 1616 Fourth Street, Santa Rosa.
Meeting, *Second Thursday.*

Stanislaus County Medical Society
President, J. Lyle Spellman, P. O. Box 1412, Modesto.
Secretary, Richard R. Treadwell, P. O. Box 801, Modesto.
Meeting, *Second Friday, 7:30 p. m., Hotel Hughson.*

Tehama County Medical Society
President, E. R. Wilson, Red Bluff.
Secretary, R. G. Frey, Red Bluff.
Meeting, *At Call of President.*

Tulare County Medical Society
President, George Keiper, Bank of America Building, Visalia.
Secretary, Irvin H. Betts, 222 West Willow Street, Visalia.

Ventura County Medical Society
President, A. W. Cruden, Saticoy.
Secretary, George H. Arnold, Route 2, Box 12, Ventura.
Meeting, *Second Tuesday, Ventura County Country Club.*

Yolo County Medical Society
President, Charles S. Roller, 604 Woodland Avenue, Woodland.
Secretary, Emery Leivers, Woodland Clinic, Woodland.
Meeting, *First Wednesday.*

Yuba-Sutter-Colusa County Medical Society
President, Leon M. Swift, Box 244, Marysville.
Secretary, D. Ermoreine Edwards, 725 Fourth Street, Marysville.
Meeting, *Second Wednesday.*

(For roster of C.M.A. committees and other organization, see last month's issue.)



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COMING MEETINGS

Association of Military Surgeons of the U. S. Convention, Detroit, Oct. 9-11, 1946.

California Heart Association Symposia, San Francisco, Oct. 16-19; San Diego, Oct. 21; Los Angeles, Oct. 23-25, 1946.

International College of Surgeons, U. S. Chapter Eleventh Annual Assembly, Detroit, Oct. 21-23, 1946.

A.M.A. Secretaries' and Editors' Conference, Chicago, Dec. 7-8, 1946.

A.M.A. Semi-annual Meeting of House of Delegates, Chicago, Dec. 9-11, 1946.

A.M.A. Second Annual Conference of Rural Health, Chicago, Feb. 7-8, 1947.

A.M.A. Annual Conference on Medical Service, Chicago, Feb. 9, 1947.

A.M.A. Congress on Medical Education, Chicago, Feb. 10-11, 1947.

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(Continued on Page 16)

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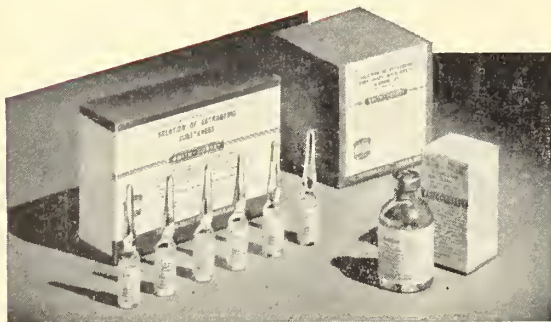
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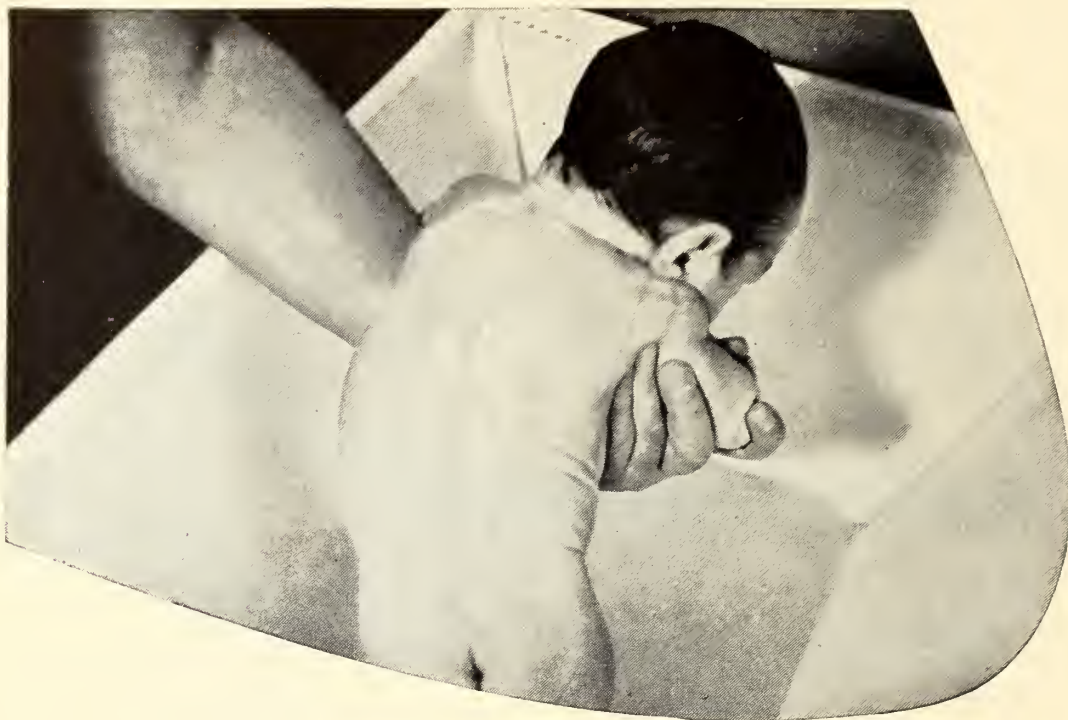
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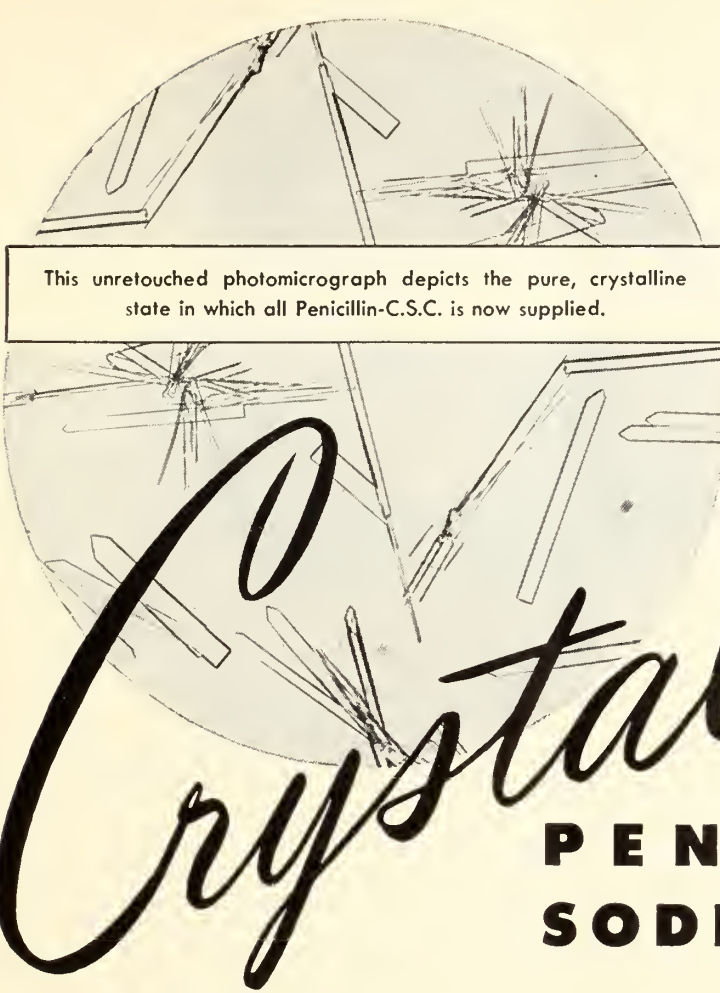
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Crystalline Penicillin Sodium-C.S.C. is so heat-stable that it can be kept at room temperatures, virtually indefinitely without losing its potency.* It can now be carried in the physician's bag or stored on the pharmacy shelf. No longer need the physician wait until the patient can be hospitalized or until refrigerated penicillin can be obtained from the nearest depot.

*CAUTION: Once in solution, however, penicillin still requires refrigeration.

Crystalline Penicillin Sodium-C.S.C. is available in serum-type vials containing 100,000, 200,000, or 500,000 units.



Penicillin-C.S.C. is accepted by the Council on Pharmacy and Chemistry of the American Medical Association

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Optimal Therapeutic Activity

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¹"The potency of the penicillin undoubtedly affected the results. The first 15 patients, all treated with the same batch of penicillin, were cured. The next 7 patients were treated with the same dosage of a different batch of penicillin. Five of these 7 were not cured. Assays of penicillin used for these 7 patients showed it to be of reduced potency." Trumper, M., and Thompson, G. J.: Prolonging the Effects of Penicillin by Chilling, J.A.M.A. 130: 628 (March 9) 1946.





Acceptable

AT EVERY SEASON

Taken cold during the summer months or hot during the wintertime, the delicious food drink made by mixing Ovaltine with milk provides a wealth of essential nutrients in readily digested and assimilated form. Its delicious taste makes it enjoyable at every season. As a supplement to an inadequate diet, in the correction of the milder forms of malnutrition, or when the intake of all essential nutrients must be augmented, it makes a worth-while contribution, as

indicated by its composition shown in the table below. This dietary supplement provides biologically adequate protein, readily utilized carbohydrate, highly emulsified fat, ascorbic acid, B complex and other vitamins, and essential minerals. Its low curd tension makes for rapid gastric emptying and easy digestibility. It is relished by both children and adults, and is unusually acceptable either as a mealtime beverage or with between meal snacks.

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Three servings daily of Ovaltine, each made of
 $\frac{1}{2}$ oz. of Ovaltine and 8 oz. of whole milk,* provide:

CALORIES	663	VITAMIN A.....	3000 I.U.
PROTEIN	32.1 Gm.	VITAMIN B ₁	1.16 mg.
FAT.....	31.5 Gm.	RIBOFLAVIN.....	1.50 mg.
CARBOHYDRATE.....	64.8 Gm.	NIACIN.....	6.81 mg.
CALCIUM.....	1.12 Gm.	VITAMIN C.....	39.6 mg.
PHOSPHORUS.....	0.939 Gm.	VITAMIN D.....	417 I.U.
IRON.....	12.0 mg.	COPPER.....	0.50 mg.

*Based on average reported values for milk.

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CLASSIFIED ADVERTISEMENTS

(Continued from Page 8)

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DERMATOLOGIST, eligible for board, age 35, veteran, desires association with California group. Only offers leading to eventual partnership will be considered. Reply Box 9930, California Medicine.

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ASSISTANCY with Internist wanted by physician. 27 months excellent civilian training and 2 years in General Hospitals with the Army. Box 9960, California Medicine.

QUESTION USEFULNESS OF QUARANTINE AGAINST POLIOMYELITIS

Usefulness of quarantines established by some states to prevent the spread of poliomyelitis is held "highly questionable" by *The Journal of the American Medical Association*. In the July 27 issue, *The Journal* says in an editorial:

"This year, as in previous years, some sections of the country have developed an exceptionally high incidence of poliomyelitis. A few cities in southern Florida were involved in this manner. One of the neighboring states considered the establishment of a quarantine against Florida residents. Georgia actually imposed such a quarantine against all persons coming from the former state, even including Pensacola, which is 402 miles from the nearest city in which there has been an outbreak of poliomyelitis that could possibly be considered as epidemic in nature. The usefulness of this interstate quarantine is highly questionable. The overwhelming consensus of authorities in epidemiology and public health is that such interstate quarantine does not serve any useful purpose in preventing the spread of poliomyelitis. In the absence of more specific knowledge on the methods of spread of the poliomyelitis virus than is now available, state quarantine can only be considered reminiscent of the old practice of shot-gun quarantine against yellow fever before learning the role of the yellow fever bearing mosquito."

~ La Loma Feliz ~

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Digifolin Trade Mark Reg. U. S. Pat. Off. and Canada

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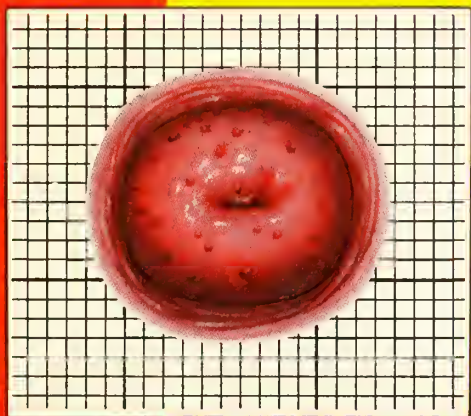
Dial Trade Mark Reg. U.S. Pat. Off. and Canada (Brand of diallylbarbituric acid)



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Leukorrhea due to *Trichomonas* infection is effectively eradicated by the Vioform two-part treatment. In the physician's office, the vaginal vault is thoroughly covered with Vioform Insufflate. The patient continues treatment at home by placing a moistened Vioform Insert in the posterior fornix nightly. Both preparations contain Vioform, a specific for the trichomonad, together with other components to restore normal vaginal acidity and favor growth of Doderlein bacilli. Supplied: Vioform Insufflate, bottles of 1 and 8 ounces; Inserts, boxes of 15.

Composition — VIOFORM INSUFFLATE: 25% Vioform, 10% boric acid, 20% zinc stearate, 42.5% lactose, 2.5% lactic acid. VIOFORM INSERTS: 250 mg. Vioform, 25 mg. lactic acid, 100 mg. boric acid.

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In Canada: Ciba Company Limited, Montreal



A.M.A. FUND CONTRIBUTORS THANKED

The ninety-fifth convention of the A.M.A. is now a matter of medical history and its outstanding success a matter of record.

John W. Cline, Chairman of the General Committee, described the results in a letter of thanks to subcommittee chairmen. He said:

"The comments of delegates and visitors from other states have been highly complimentary to the San Francisco County Medical Society. The splendid arrangements for the convention and the warm hospitality extended to the visiting physicians were greatly appreciated. The Society and its officers have received numerous letters expressing the gratitude of the visitors, especially from members of the House of Delegates."

The credit goes to the members of the Society who handled the many details of the program, according to

Dr. Cline. An equal share of the credit, he pointed out, goes to the hundreds of members of this Society who contributed their financial support, as well as to the other county societies in California, the hospitals and the business firms who donated substantial amounts of money to help defray the cost of entertaining our guests.

Receipts Tabulated

Here are the detailed figures on receipts:

335 Members—

S. F. County Medical Society.....	\$10,033.00
Business Firms	3,000.00
Other County Medical Societies of Calif.....	2,216.50
Hospitals	1,428.00

Total Receipts\$16,677.50

(Continued on Page 22)



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Prescribe 2 or 3 tablets of Theocalcin, t. i. d. After relief is obtained, continue with smaller doses to keep the patient comfortable. Theocalcin strengthens heart action, diminishes dyspnea and reduces edema.

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*Analysis
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*in 151 patients:**

“... efficient in relatively small doses and exerts its influence within a reasonably short time.”*

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A development of the Medical Research Division of Sharp & Dohme, Sulfamerazine is supplied in 0.5-Gm. tablets, for oral administration, in bottles of 100, 500 and 1,000; also in ¼-pound packages of powder. Sodium Sulfamerazine sterile powder, for intravenous administration, is supplied in 5-Gm. vials and in 50-cc. ampuls of a 6% solution. Sulfamerazine chemical reagent is supplied in 1-Gm. vials. Sharp & Dohme, Philadelphia 1, Pa.

*New Orleans Med. & Surg. JI., 98:63-65, August 1945.





Sturdy

ON STRONG FOUNDATIONS

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- Similarly, for sturdy bodies in later years a strong nutritional foundation must be established early in infancy.
- For this assurance, BIOLAC safely and simply furnishes nutritional elements for optimum health. Among the other essential nutrients are valuable proteins of milk, an outstanding source of *all the essential amino acids* ... the indispensable foundation stones for sound tissues.
- Indeed, BIOLAC is “baby talk” for a good square meal.

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Quickly prepared... easily calculated: 1 fl. oz. Biolac to 1½ fl. oz. water per lb. of body weight.



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mental depression in the menopause

"... because the involutional period is fraught with sadness the different forms of mental disorder of this age may be highly colored with mental depression."^{*}

Severe menopausal depression, marked by apathy and psychomotor retardation, is frequently progressive. Hence, if not promptly and effectively treated, it may seriously impair the patient's normal capacity for useful living.

In such cases, Benzedrine Sulfate helps to overcome the depression, to restore optimism and to reawaken the savor and zest of life. Needless to say, Benzedrine Sulfate is not indicated in the casual case of low spirits, as distinguished from true prolonged mental depression.

^{*}Hinsie, Leland E.: *The Person in the Body, an Introduction to Psychosomatic Medicine*, New York, W.W. Norton & Co., 1945, p. 223.

Tablets and Elixir

benzedrine sulfate



(racemic amphetamine sulfate, S.K.F.)

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boils



pustular acne



STAPHYLOCOCCUS TOXOID

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AMONG the many conditions which especially enlist the sympathy of the physician—and tax his efforts to ameliorate the psychic as well as the somatic symptomatology—are boils and acne.

A growing literature reports the value of Staphylococcus Toxoid in the prophylaxis and therapy of various staphylococcic pyodermas and localized pyogenic processes due to *S. aureus* and *albus*. The toxoid induces the production of staphylococcus antitoxin in immunized persons, and there is accumulating evidence of its value in producing active immunity to the dermonecrotic and hemolytic elements of

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Staphylococcus Toxoid (Pitman-Moore) is supplied in 5 cc. vials containing in each cubic centimeter the toxoid derived from 1,000 necrotizing doses of the toxin. Preserved with 1:10,000 sodium ethyl mercuri thiosalicylate. Comprehensive information with each package.

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Recurrent styes, boils, carbuncles
Pustular acne associated with furunculosis
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Staphylococcal infection of accessory nasal sinuses
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Division of  Allied Laboratories, Inc. • Indianapolis 6, Indiana

A.M.A. FUND CONTRIBUTORS THANKED

(Continued from Page 17)

Following are the county medical societies who contributed sums ranging up to \$1,000:

Alameda County Medical Association, Contra Costa County Medical Society, Fresno County Medical Society, Kings County Medical Society, Los Angeles County Medical Association, Monterey County Medical Society, Orange County Medical Association, Riverside County Medical Society, San Bernardino County Medical Society, San Joaquin County Medical Society, San Luis Obispo County Medical Society, San Mateo County Medical Society, Solano County Medical Society, Tulare County Medical Society, Ventura County Medical Society.

Following are the hospitals who donated amounts ranging up to \$500.

Franklin Hospital, Hahnemann Hospital, Mary's Help Hospital, St. Francis Hospital, Southern Pacific Hospital.

The following business firms contributed sums up to \$500:

Borden's Dairy Delivery Company, Bowerman Pharmacy, Broemmel's Pharmacy, Broemmel's Prescription Pharmacy, California Brewer's Institute, City of Paris, Don Baxter, Inc., Eli Lilly Company, Grace Line, Inc., Guy's Prescription Pharmacy Matson Navigation Company, Mead Johnson & Company, Medical Arts Pharmacy, Medico-Dental Pharmacy, Merck & Company, Parke Davis & Company, Ransohoff's, Upjohn Company, Winthrop Chemical Company, Inc., Yellow Cab Company.

Thanks Expressed

The officers and directors of the San Francisco County Medical Society, the chairmen and men and women of the A.M.A. Convention committees, take this opportunity of thanking each of the 335 loyal members of the Society

(Continued on Page 26)

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MEDICAL SCHOOL AND HOSPITAL

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EYE, EAR, NOSE AND THROAT

A complete full-time course covering an academic year (9 months), consisting of attendance at clinics, witnessing operations, lectures, demonstrations of cases and cadaver demonstrations; operative eye, ear, nose and throat on the cadaver; head and neck dissection (cadaver); clinical and cadaver demonstration in bronchoscopy and facial palsy; refraction; roentgenology; pathology, bacteriology and embryology; physiology; neuro-anatomy; anesthesia; physical therapy; allergy; examination of patients pre-operatively and follow-up post-operatively in the wards and clinics; work in the out-patient department as assistant.

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A combined course comprising attendance at clinics and lectures; instruction in examination, diagnosis and treatment; witnessing operations; ward rounds; demonstration of cases; pathology; radiology; anatomy; operative proctology on the cadaver.

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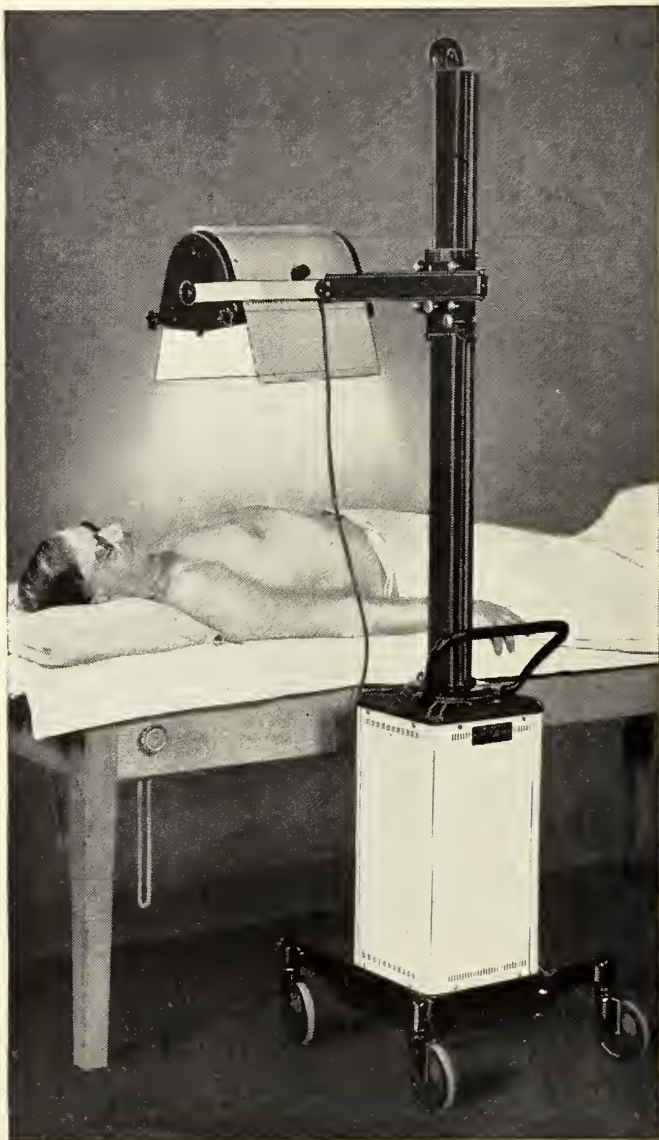
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The source of ultraviolet radiation is the reliable Uviarc—high pressure mercury quartz burner—whose emission characteristics cover the full range of therapeutic ultraviolet.

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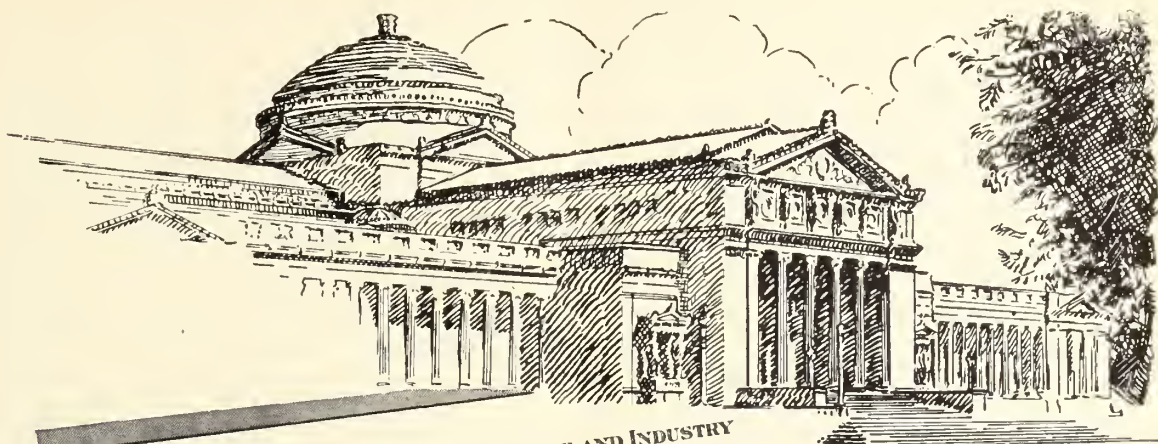
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August 7, 1946

Mr. C. H. Fleck, President
S. H. Camp and Company,
Jackson, Michigan

Dear Mr. Fleck:

Today marks the 10th Anniversary of the Transparent Woman exhibit and since the famous "lady" is making her permanent home in our Medical Section, we feel that the day should not be allowed to pass without some comment.

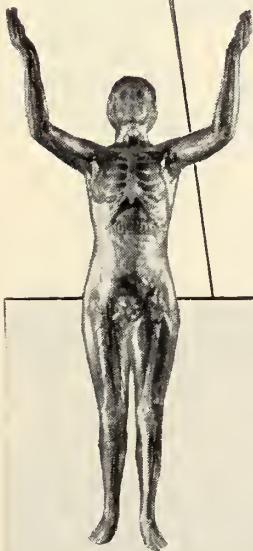
I vividly recall the premier of the Transparent Woman at Rockefeller Center in New York City before a distinguished assembly of physicians, scientists and educators. Its later tour throughout the Nation under the auspices of state and county medical societies and academies of medicine was a significant contribution to public health education. You are to be congratulated not only on your sponsorship of this important and effective exhibit but also on the ethical manner in which it was presented to the laity through the profession.

The Transparent Woman continues to be one of the major centers of interest at the museum. Practically all of the 1,026,250 visitors last year made her acquaintance and preliminary 1946 figures show the attendance running higher.

It is fitting on this 10th Anniversary of the Transparent Woman exhibit to again express our appreciation to you for your active interest in the Medical Section.

Cordially yours,

Eben J. Carey
EBEN J. CAREY, M.D., Curator,
Medical Exhibits



CAMP TRANSPARENT WOMAN EXHIBIT MARKS TENTH ANNIVERSARY

Dedicated at Rockefeller Center in 1936 by world famous figures in medicine, science and education, the *Transparent Woman* has since been viewed by some 50,000 physicians and 16,000,000 laymen. Its steady pop-

ularity in the Medical Section of the Museum of Science and Industry verifies our hope that the exhibit will continue to play its authentic role in public health education within the precepts of the medical profession.

S. H. CAMP and COMPANY • JACKSON, MICHIGAN

A.M.A. FUND CONTRIBUTORS THANKED

(Continued from Page 22)

whose financial contributions insured the success of the convention. The Society also wishes to express its deep appreciation to the component county societies, the hospitals and business firms listed above, and to assure them that their generous support and cooperation will be remembered and reciprocated.

MORE HOSPITALS JOIN RAPID TREATMENT PROGRAM FOR SYPHILIS

Shasta and Humboldt County Hospitals have agreed to participate in the rapid treatment program for syphilis,

bringing the total number of county hospitals under this plan to 22, according to California Health, published for the State Department of Public Health.

The number of patients being treated in county hospitals by rapid therapy methods increased from 22 in January to 104 in May. During the first six months of 1946 a total of 445 persons completed the treatment.

It is hoped that more of the county hospitals will join the plan and that more patients will seek the treatment offered in this way.

The department is assured by the U. S. Public Health Service that the project written by the State Health Department to treat 300 such cases per month will be approved and the money will be available for this project.

ST. LUKE'S HOSPITAL

SAN FRANCISCO

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A limited General Hospital of 200 beds admitting all class of patients except those suffering from communicable or mental diseases. Organized in 1871, and operated by a Board of Directors, under the direction and supervision of the Executive Committee of the Medical Staff.

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THE PERFECT NEUTRALIZER

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SPOT TESTS

SIMPLIFY URINALYSIS

NO TEST TUBES • NO MEASURING • NO BOILING

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Galatest

FOR DETECTION OF SUGAR IN THE URINE

Acetone Test (DENCO)

FOR DETECTION OF ACETONE IN THE URINE

THE SAME SIMPLE TECHNIQUE FOR BOTH

1. A LITTLE POWDER



2. A LITTLE URINE

COLOR REACTION IMMEDIATELY



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PENICILLIN EFFECTIVE AGAINST HIGHLY RESISTANT GRAM-NEGATIVE BACTERIA

A patient suffering from empyema, an infection characterized by formation of pus in the chest, was successfully treated with penicillin in spite of the presence of gram-negative organisms which usually are resistant to this antibiotic drug, according to three physicians writing in the July 27 issue of *The Journal of the American Medical Association*.

The doctors are Edwin M. Ory, George Gee Jackson and Maxwell Finland of the Department of Medicine, Harvard Medical School.

Since Sir Alexander Fleming's discovery of penicillin in 1929, numerous investigators have confirmed and extended his findings that gram-negative organisms are resistant to penicillin. However, the authors state that the recovery of this patient in whom the organism was a gram-negative bacillus "suggests that one need not be

entirely discouraged from pursuing penicillin treatment because of such a finding."

The patient, a white man aged 59, was admitted to the Boston City Hospital, Oct. 30, 1945, complaining of cough and shortness of breath. A surgical puncture of the chest was made to withdraw the pus and to instil penicillin in doses of 100,000 to 200,000 units. The fluid which was withdrawn yielded gram-negative bacilli. Guinea pigs inoculated with it died within 24 hours. The authors state that the patient's "clinical condition improved dramatically within 36 hours and thereafter the course was one of progressive improvement. . . . The patient was discharged from the hospital on the 28th hospital day."

In conclusion, the physicians declare that although the "favorable initial response may be ascribable in part to the removal of the infected fluid, the continued improvement and the end result must be credited to the penicillin."

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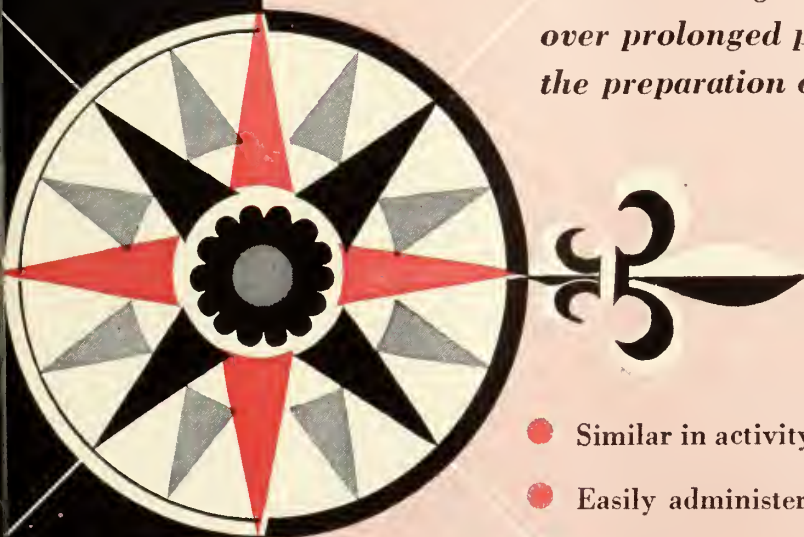
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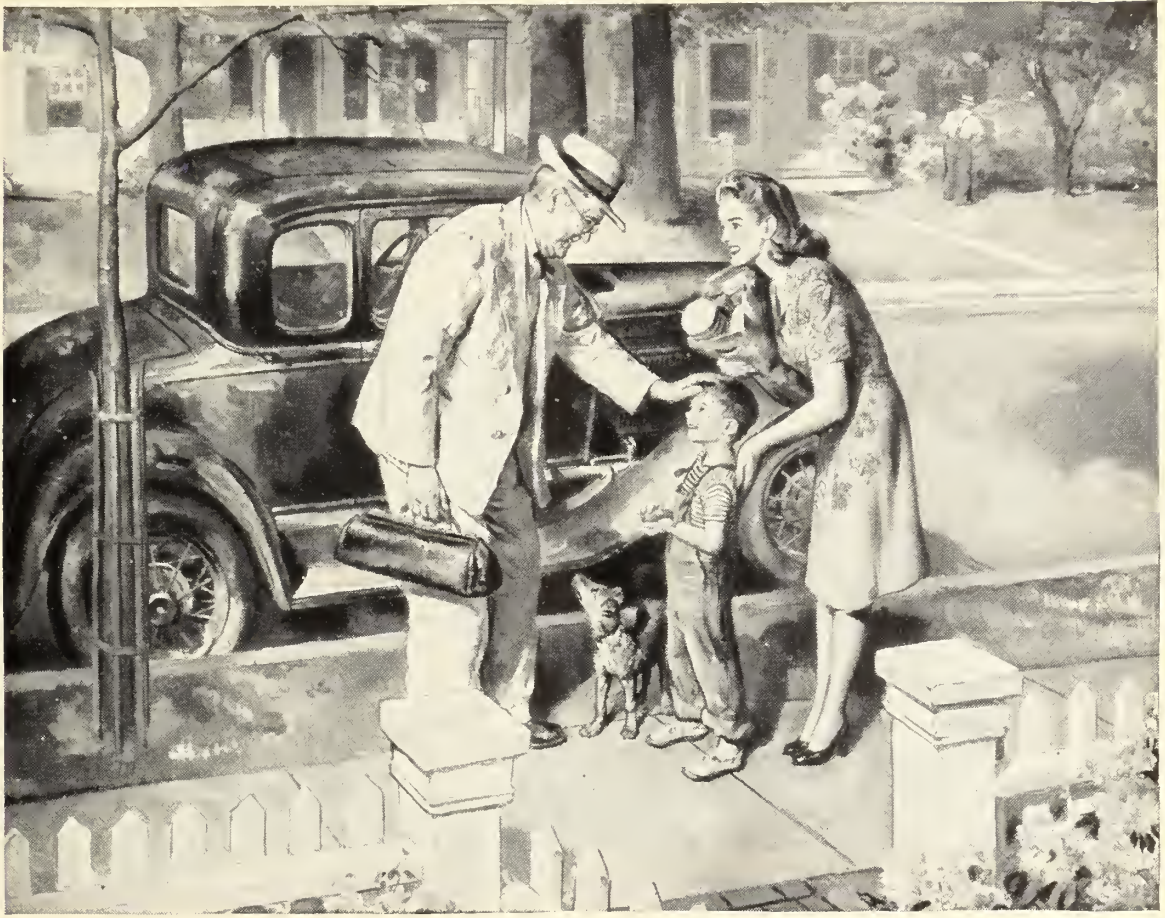
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BOARD PROCEEDINGS

On July 1, 2 and 3, a special written examination was held in San Francisco for graduates of the University of California Medical School. Fifty-seven applicants appeared at this examination. Another examination was held August 6, 7 and 8, at the Biltmore Hotel in Los Angeles.

Applications for reciprocity are still being filed in large numbers, and we estimate that if the registration continues at the present rate at least 2,000 reciprocity applications will have been filed by the end of this year as compared with 262 during the year 1940.

The American Medical Association Meeting in San Francisco in July was used by many as a means of obtaining reciprocity information. During this week, the office was swamped with requests for information regarding the California reciprocity requirements.

The Appeals in the cases of Drs. Aarons, Burroughs, and Mann will be heard before the Appellate Court during the later part of this year and a decision may be reached before the end of 1946.

All hospitals in California are being notified by the Board that residents must have a license issued by this Board in order to act as residents in hospitals in this state.

News

"Jury Convicts Dr. Collins—Dr. Samuel D. Collins, Los Angeles chiropractor, was convicted late Thursday by a Superior Court jury of performing an illegal operation in April, 1945, on Nicaraguan-born Miss Josepha Chevez, 21, Altadena. . . . Theodore Emery, 34, who met Miss Chevez in Nicaragua in 1944 when he was employed on the Pan-American Highway and co-defendant in the action with Dr. Collins in the case, was convicted in a separate trial earlier, and faces sentence Monday. . . . Collins' attorney moved for a new trial."—Pasadena, California, *Star-News*, July 9, 1946.)

"Doctor Fined \$350—Dr. Monte Salvin, M.D., recently convicted in Municipal Court of violating the State Health Code by issuing fictitious narcotic prescriptions, yesterday was ordered to pay a \$350 fine or spend 35 days in jail." (Los Angeles, California, *Examiner*, July 9, 1946.)

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FINAL DIAGNOSIS <u>Hemiplegia</u>	Date <u>June 15, 1946</u>	Pan in region of <u>infection</u> — improved	
RESULT <u>Recovered</u> — Improved — Unimproved — Died	Occupation <u>Accountant</u>		
PERSONAL: Age <u>28</u> Sex <u>Male</u>	M. W. D. <u>Single</u>		
FAMILY HISTORY: <u>Negative</u>			
HABITS: <u>Non</u>			
PAST HEALTH: <u>U</u>			
PRESENT CONDITION: <u>on his</u> <u>feet</u>			
PHYSICAL EXAMINATION: <u>7</u>			
TEMP: <u>9</u>			
HEAD: (in <u>For</u>			

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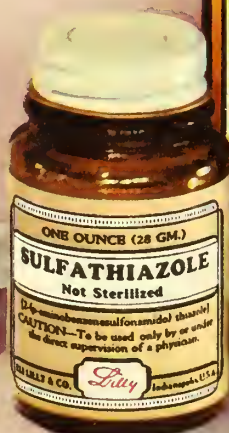
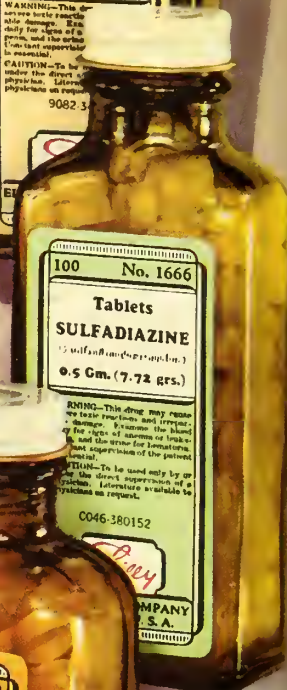
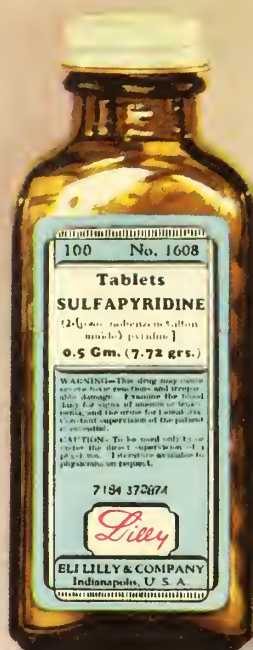
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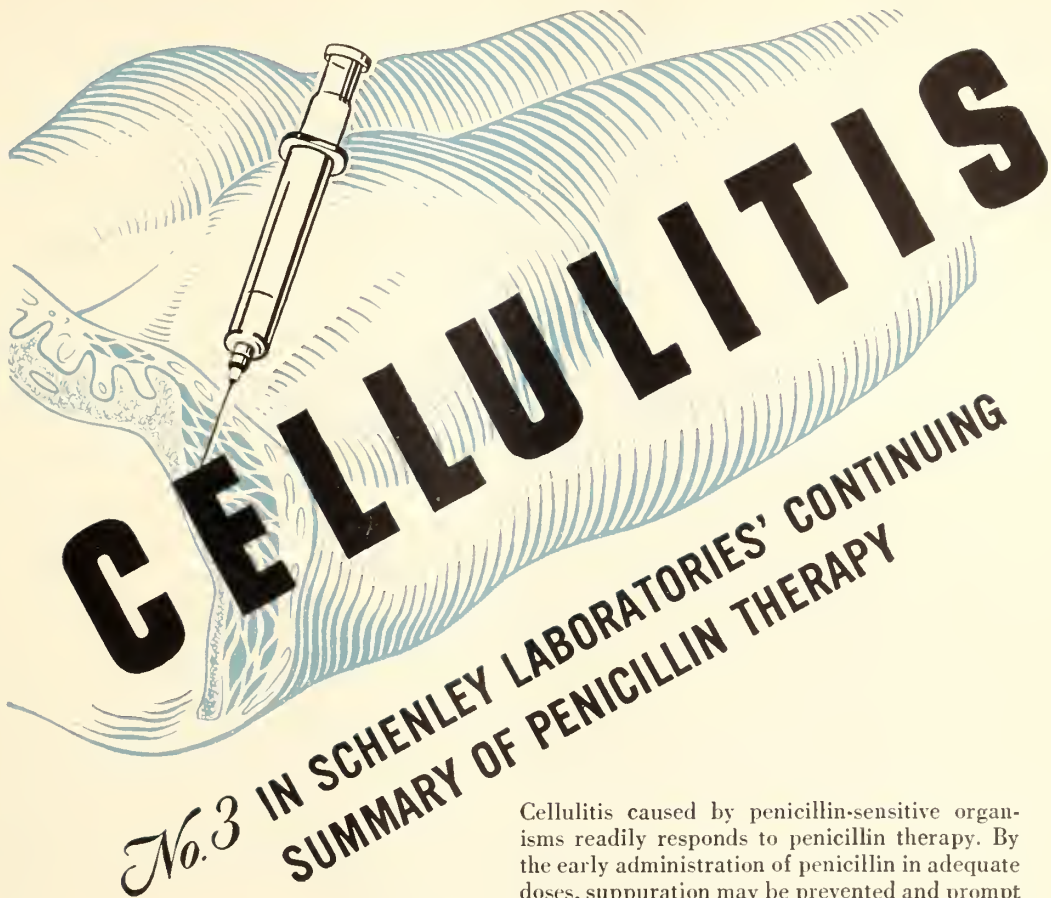
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WOLLGAST, C. F.: *The Clinical Use of Penicillin: A Report of 115 Cases Treated in an Army Hospital, Texas State J. M.* 40:225 (Aug.) 1944. **FARQUHARSON R. F., GREEY, P., & TOWNSEND, S. R.:** *Results of Penicillin Therapy: A Report for the Joint Services Penicillin Committee, Canad. M. A. J.* 53:1 (July) 1945.



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1. Follis, R. H. Jr.; et al: *Am. J. Dis. of Child.*, 66:1-11 (July) 1943.

2. Moore, C. U.; et al: *Am. J. Dis. of Child.*, 54:1227-28 (Dec.) 1937.

3. Park, E. A.: *Vitamin D Therapeutics, THE VITAMINS*, A. M. A., Chicago, 1937.

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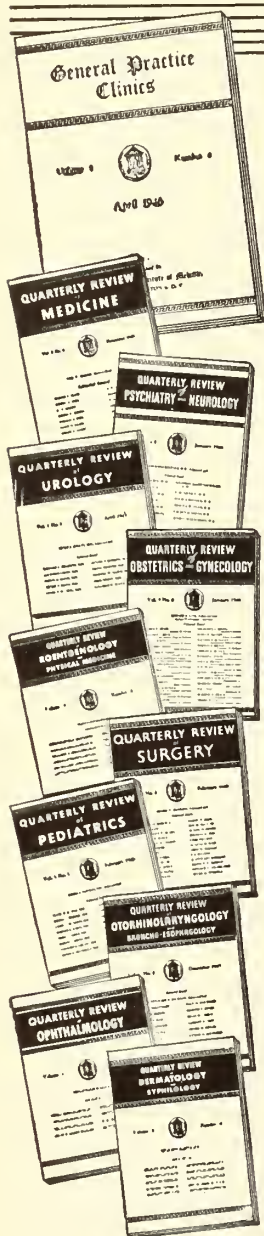


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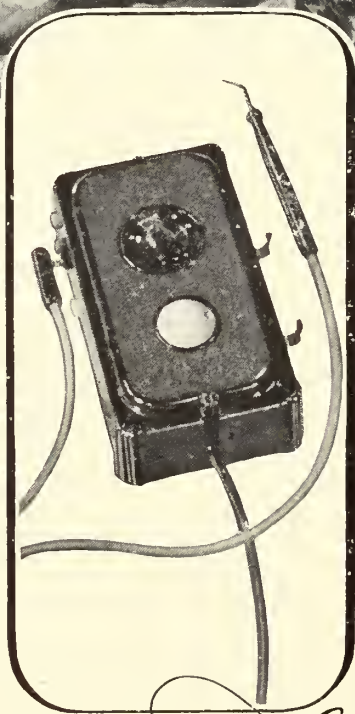
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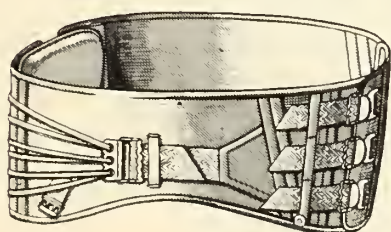
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Tavares, Clement, from *San Francisco County* to *Fresno County*

(Continued on Page 18)

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"This love scene is giving me a stiff neck," he says.—*From Harrison Carroll's movie column in the San Francisco Call-Bulletin.*

Sounds like a bad dislocation.

Parts of a dismembered body, carefully packed in two paper cartons and a milk can, were found last night in an alley behind the Paramount Theatre on Market Street. . . .

Deputy Coroner William Under, who arrived on the scene in response to a police call, said, "this is certainly a murder."—*From a news story in the San Francisco Examiner.*

Pretty hard to fool even a deputy coroner.

TRICKED

On looking through my husband's copy of the September issue of Medical Economics, I saw in the index an article which gave promise of great things—"New Tricks for Old Bags." I turned with eager anticipation to page 66 to find merely suggestions for refitting and arranging of medical kits.—*Submitted by K.R.M.*

Superficial examination indicated the victim had been a large person. It was not at once possible to determine the sex. The head was missing.—*From the San Francisco Examiner.*

Head, that is.

OR COUNT TEN

When a young woman shipyard worker was brought to the infirmary with a lower back injury, the nurse who prepared her for examination watched her husk out of a suit of coveralls, a pair of corduroys, then a pair of jeans, and finally her panties. Asked why she was so fulsomely clothed, the young woman replied, "It gives a girl a chance to reconsider."—*Submitted by F.R.E.*

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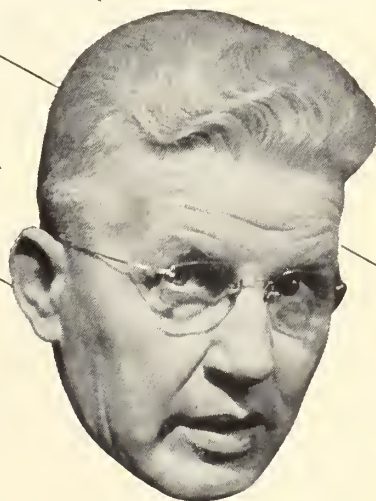
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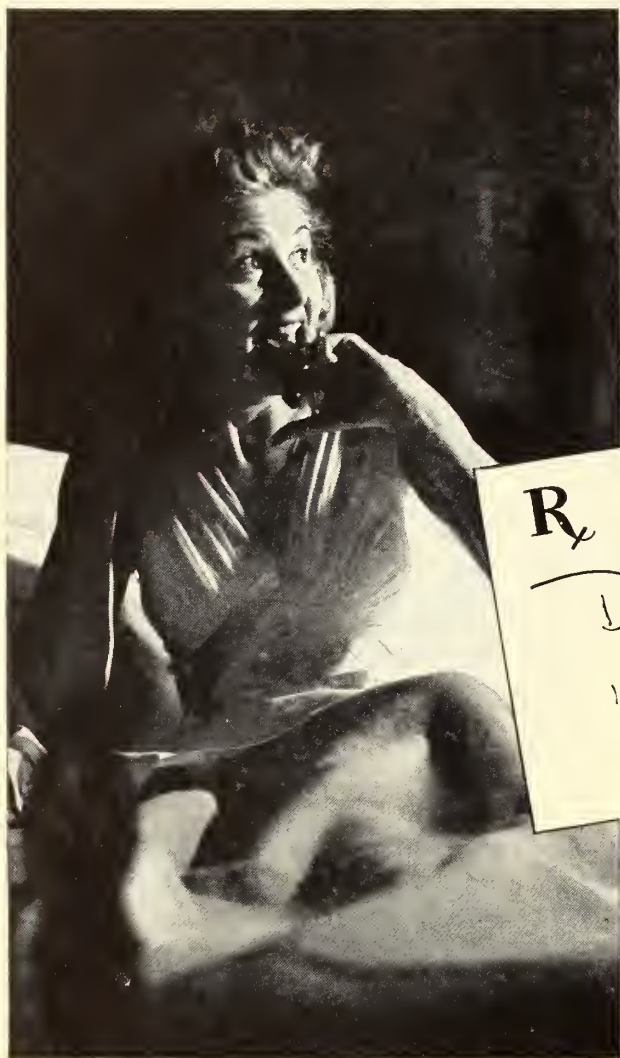
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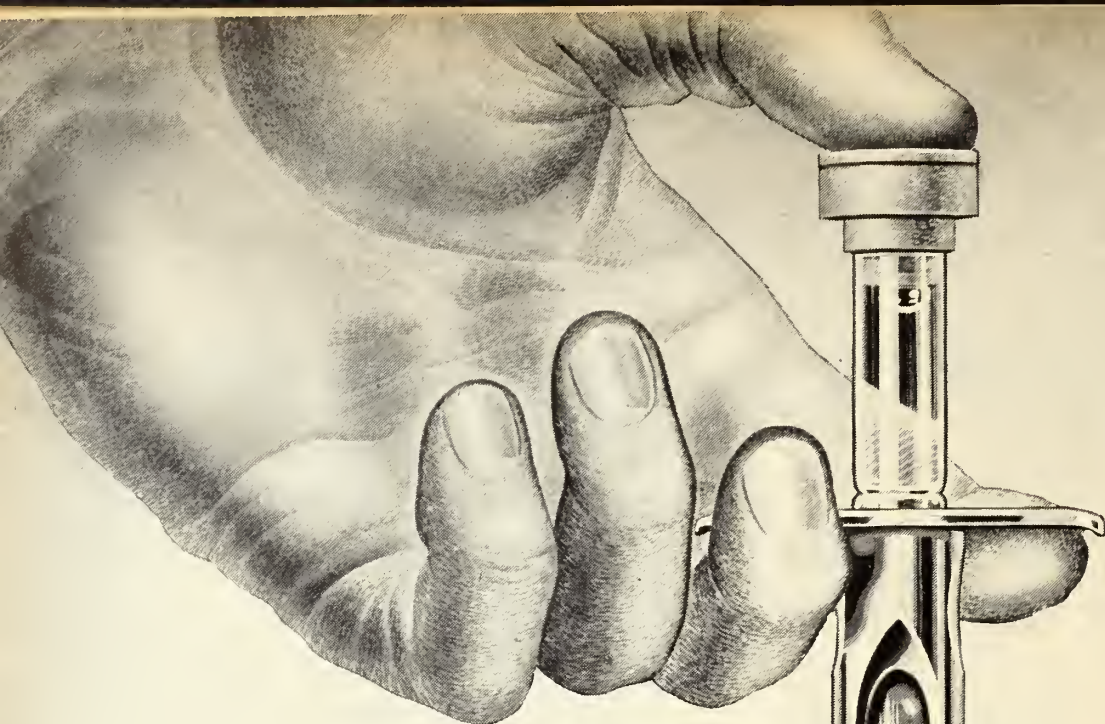
I. Watson, B. P.: J. Clin. Endocrinology 4:571 (Dec.) 1944.

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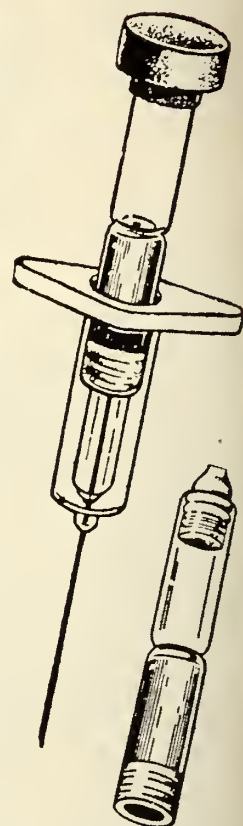


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(Continued from Page 16)

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PENICILLIN BRINGS SPEEDY RECOVERY IN SKULL INFECTIONS

Penicillin offers the patient suffering from infections involving the central nervous system and skull the most effective and rapid way to recovery, according to five San Francisco investigators.

Writing in the August 10 issue of *The Journal of the American Medical Association*, H. C. Naffziger, M.D., Helen Warmer, A. B., Walter E. Stern, M.D., Roberta Fenlon, M.D., and H. J. McCorkle, M.D., from the Division of Surgery of the University of California Medical School, say that during the past two years they gave penicillin to 37 patients with infections involving the central nervous system and skull.

(Continued on Page 20)

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With bones in the process of most rapid growth at least through the 14th year, the requirements for vitamin D must be met unfailingly for as long as growth persists. The discovery of rickets in 46.5% of children between the ages of 2 and 14 in careful histologic studies¹ gives unequivocal proof of the necessity for such continued supplementation. Upjohn vitamin D preparations supply all—natural vitamin D, plus ample vitamin A, in highly potent, convenient, well tolerated, and economical supplements.

1. Am. J. Dis. Child. 66:1 (July) 1943.

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FINE PHARMACEUTICALS SINCE 1886

U P J O H N V I T A M I N S

PENICILLIN BRINGS SPEEDY RECOVERY IN SKULL INFECTIONS

(Continued from Page 18)

Treatment consisted of penicillin injections into the muscles at three hour intervals, lasting anywhere from six to 114 days. The total dosage of penicillin varied from 745,000 units for those patients with infections of the skull bones but no central nervous system involvement to 36,500,000 units for patients who had signs indicating localized areas of infection within the skull.

The authors say that the response to penicillin treatment was very good in nearly all cases, often referring to the results as "excellent."

The article points out that "in three patients with

pneumococcal meningitis definite localizing signs were observed indicating intracranial abscesses originating from acute mastoiditis. Although the surgeons declined to operate on these three patients because of their critical, apparently hopeless condition, all three recovered after prolonged penicillin therapy."

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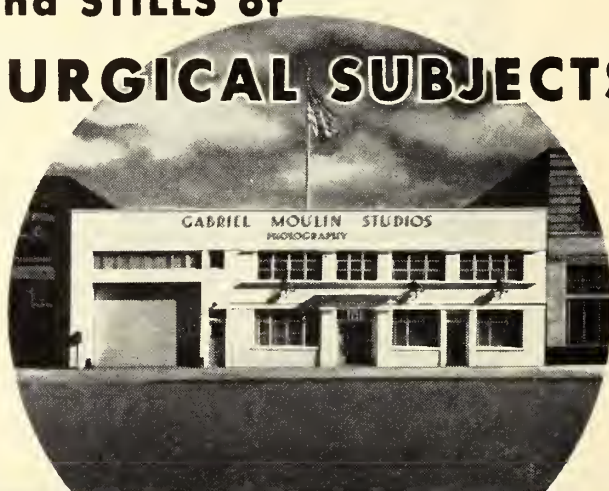
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Shambaugh, G. E., Jr.: J. Iowa M. Soc. 31:373.

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1. Lennox, W. G. (1945), *Petit Mal Epilepsies: Their Treatment with Tridione*, J. Amer. Med. Assn., 129:1069, December 15.
2. DeJong, R. N. (1946), *Effect of Tridione in the Control of Psychomotor Attacks*, J. Amer. Med. Assn., 130:565, March 2.

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DOCTORS ADVOCATE MANAGEMENT, LABOR FIGHT ON TUBERCULOSIS

Both management and labor are in an "enviable position" to fight tuberculosis today, according to Drs. Norvin C. Kiefer and Herman E. Hilleboe, surgeon and medical director, respectively, of the U. S. Public Health Service, Washington, D. C.

In an article appearing in the September 21 issue of *The Journal of the American Medical Association* the two health officials estimate that there is a national deficit of approximately 40,000 beds for tuberculous patients.

"Unquestionably," they say, "part of this shortage is a result of scarcity of building materials and labor but a large part comes from lack of comprehension of the magnitude of the problem and lack of social consciousness of the rights and needs of the unfortunate victims of the disease."

Management, Labor Can Combat Deficiencies

Drs. Kiefer and Hilleboe believe that management and labor can "combat these deficiencies" because "they have political influence, financial power and social prestige.

"The frequently wide divergence of their separate philosophies usually is ample evidence to the general public of the unselfishness of any projects in which the two cooperate equally," *The Journal* article says, adding: "The disease is of paramount importance to both of them because in the years of greatest wage earning capacity tuberculosis as a cause of death surpasses all other diseases. Tuberculosis therefore results in a serious loss of manpower in this country every year, and this loss must be borne by both employer and employee.

Industry Can Encourage More Hospitals

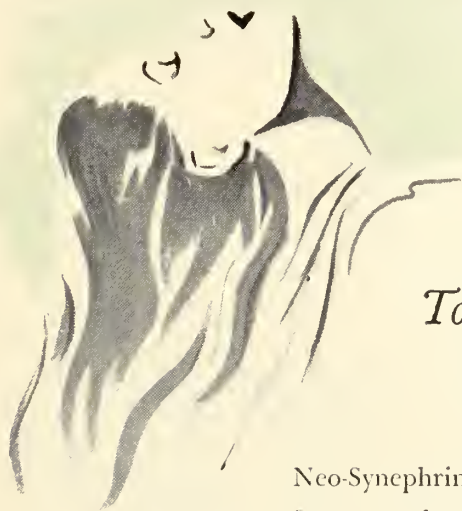
"Industry can encourage, even demand, enlarged hospital facilities. Furthermore, industrial concerns and labor unions are in a position to make substantial financial contributions, contributions which will yield large dividends in the form of saving of human suffering, misery and death. At least until an adequate number of beds in tuberculosis hospitals are available immediately to patients needing them, general hospitals could provide emergency or temporary care for the tuberculous until such a time as they can be transferred to the institutions specializing in the care of the tuberculous."

The authors estimate that "from January, 1942, to the present time over 2,000,000 people have had chest x-ray examinations by units of the U. S. Public Health Service in cooperation with state and local health organizations. During the same period the armed forces, industry and state and local health departments and tuberculosis associations have examined over 25,000,000 persons. The great majority of these people have been in the age group 15 to 65 years. These are the years of greatest industrial productivity.

"Of the persons examined by the U. S. Public Health Service 1.2 per cent have shown evidence of reinfection tuberculosis. In other words, in the people who are wage earners or potential wage earners approximately 24,000 cases of reinfection tuberculosis were discovered.

"Of equal significance is the distribution of these cases according to the classification of the National Tuberculosis Association," the two doctors state. "Roughly 70 per cent of this total number were minimal cases, 25 per cent moderately advanced and 5 per cent far advanced. The full importance of this ratio can be better appreciated when it is remembered that, by contrast, admissions to tuberculosis hospitals have consisted of only 10 per cent of minimal cases, about 30 per cent of moderately advanced cases and 60 per cent of far advanced cases. Thus routine preemployment chest x-rays and mass

(Continued on Page 28)



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DOCTORS ADVOCATE MANAGEMENT, LABOR FIGHT ON TUBERCULOSIS

(Continued from Page 26)

chest x-ray surveys have resulted in an almost complete reversal of the previous ratio between minimal and far advanced cases. Moreover, the effective utilization of mass radiography also discovers pathologic conditions in the chest other than tuberculosis and consequently is of invaluable aid to the medical profession in general."

A number of studies indicate that the tuberculous ex-patient is a satisfactory employee; therefore, the authors feel that it does not seem unfair to expect an employer to reinstate any former employee who has recovered sufficiently from tuberculosis. "This statement remains true even when, at first, the ex-patient and ex-employee is able to start at only four hours' work per day and

may have to be placed at work which is more suitable to his physical limitations. Even these disadvantages may be more than compensated by the broadening of the scope of activities of the Office of Vocational Rehabilitation. Many of these employees, as a result of insana-torium and early postsanatorium instruction and training, will return to their jobs better qualified and more productive than they were before the onset of the disease."

Employment of Recovered Patients Urged

In addition to this, the authors add, "a further necessity will be that of cooperation of industry in a general program of employment of all tuberculous ex-patients. Some of the younger patients will have developed tuberculosis before they ever had a job; others will have

(Continued on Page 30)

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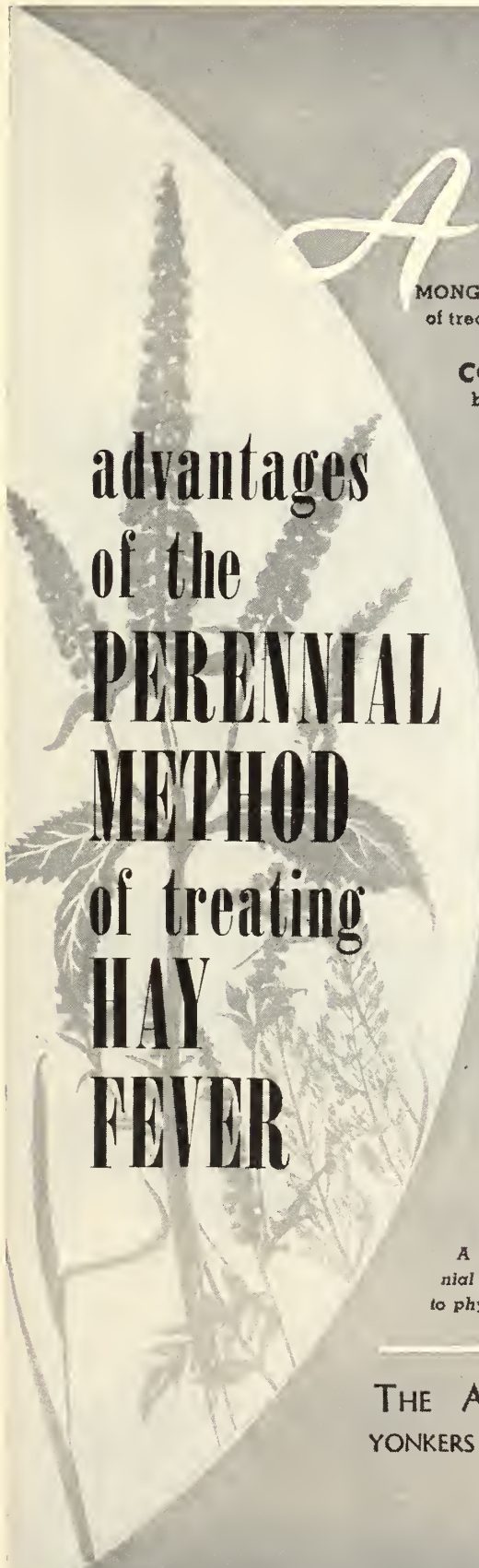
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DOCTORS ADVOCATE MANAGEMENT, LABOR FIGHT ON TUBERCULOSIS

(Continued from Page 28)

worked in plants where all of the jobs involve physical exertion to an extent which is unsafe for these people. Labor and management must cooperate in offering suitable work placement for these persons even when they are not former employees.

"It may be argued that to acknowledge such obligations is to grant special privileges to those who have recovered from tuberculosis. But is the victim of the disease the only person who gains from such an arrange-

ment? If this person is unemployed, our social code does not permit us to allow him to starve to death, although too frequently this nearly happens. He and his family must be supported by public money—and this money is raised by taxation. In the meantime however this same person dependent on charity, with little self respect, with resentment toward society, with an environment conducive to repeated breakdowns, presents a constant threat of attacks of tuberculosis to himself, to his family and to every one with whom he may come in contact. There are, therefore, strong and purely selfish reasons why management and labor should be prepared to make actual sacrifices in order to give these people any necessary privileges in obtaining jobs."



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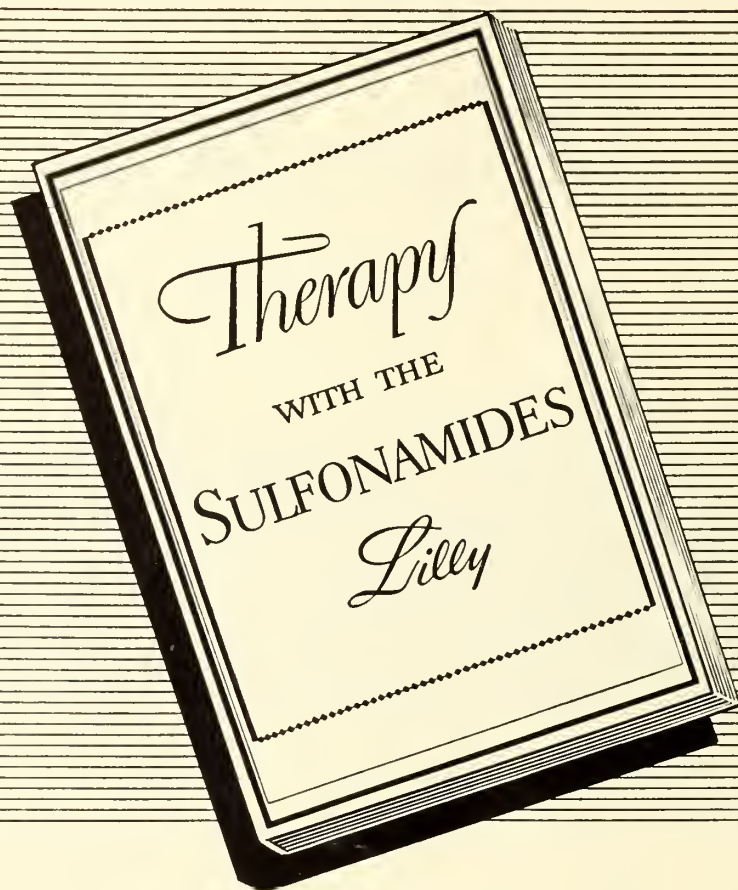
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**Laryngoscope*, Feb. 1935, Vol. XLV, No. 2, 149-154.

Laryngoscope, Jan. 1937, Vol. XLVII, No. 1, 58-60.

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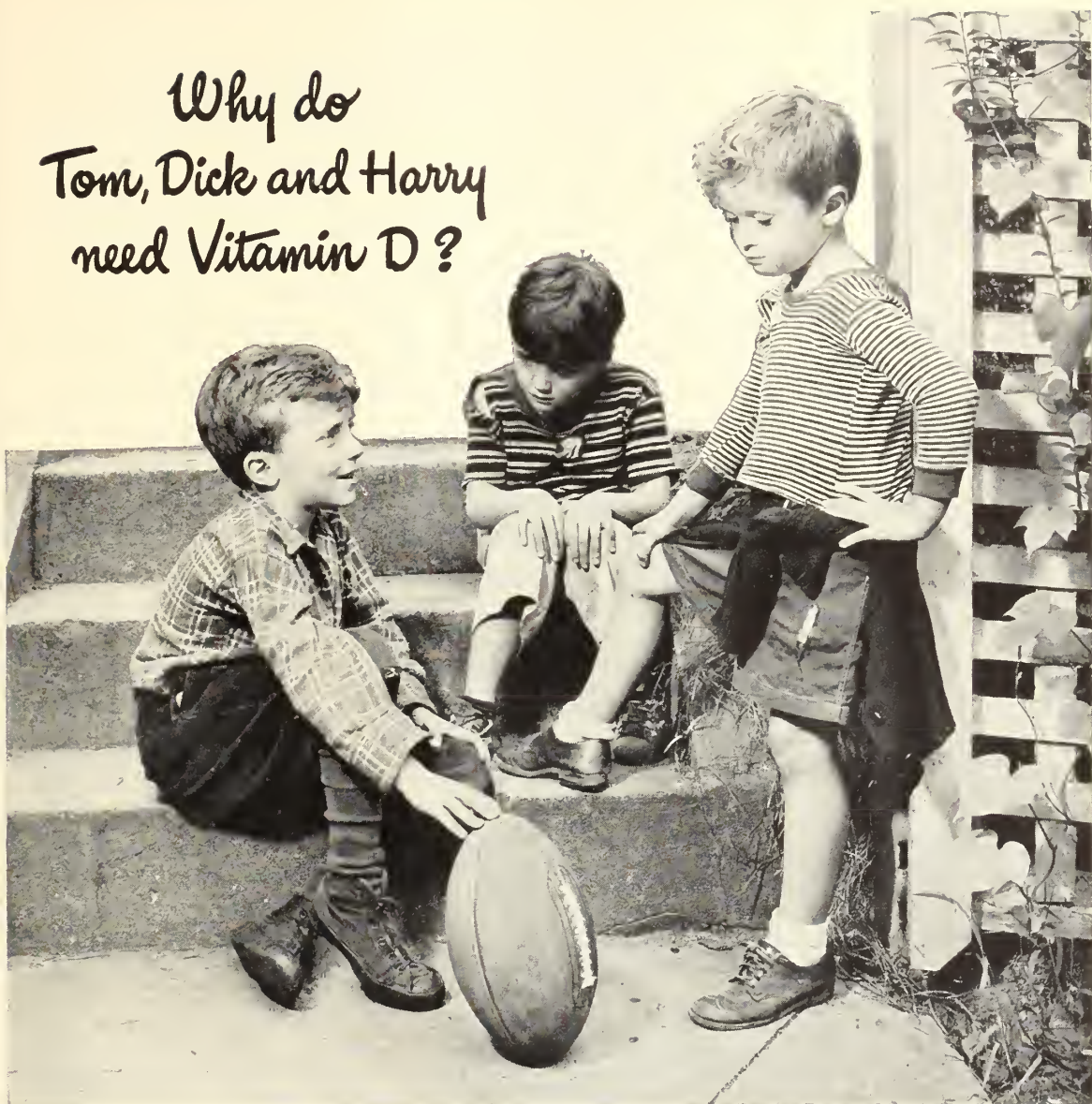
times his task is none too difficult, but he must be prepared to meet any emergency. In times of stress, production must be increased, distribution accelerated. During the recent horrifying crisis that engulfed the world, demand for new and better biological agents, improved pharmaceuticals, and blood plasma reached an unprecedented high. Eli Lilly and Company is proud of the fact that it was able to respond to wartime demands in full measure, without imposing serious inconvenience on civilian physician, pharmacist, or patient. Remaining shortages are rapidly disappearing.

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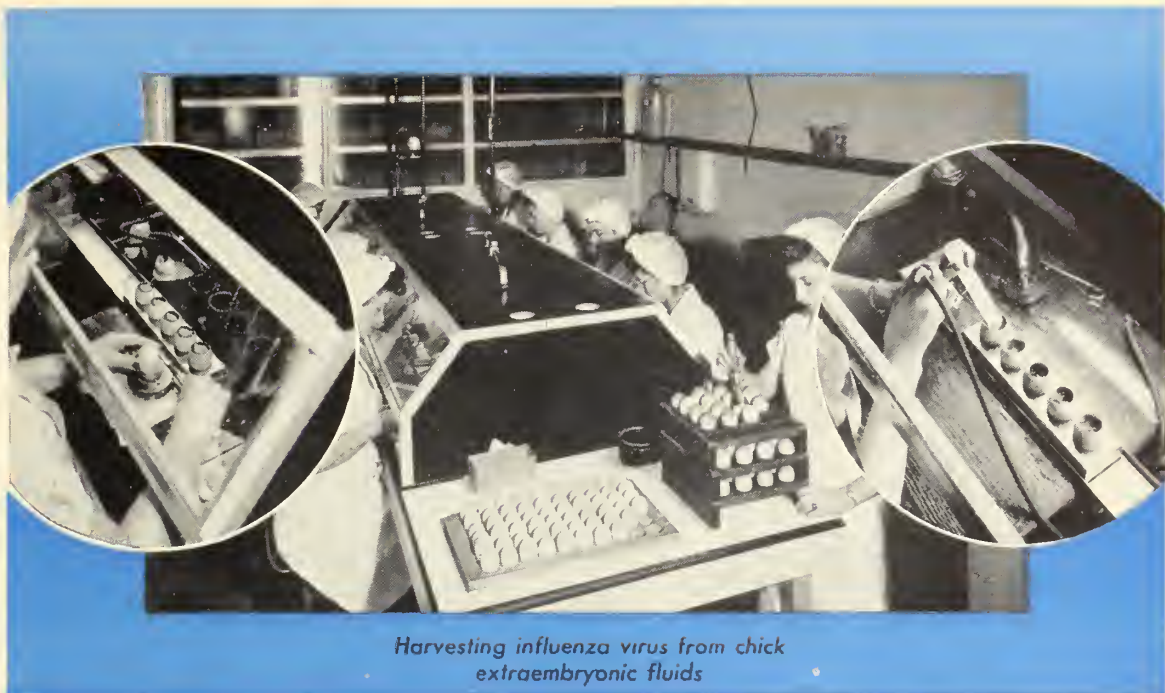


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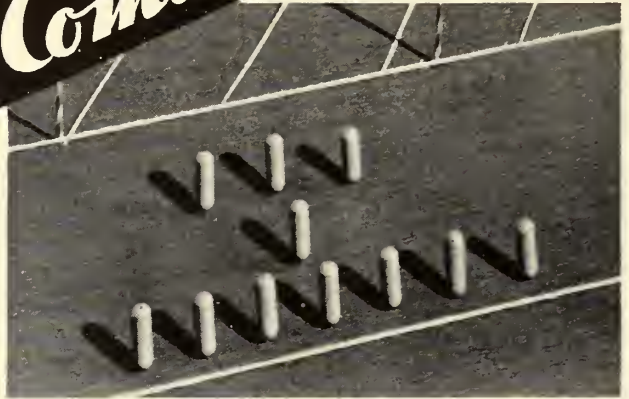
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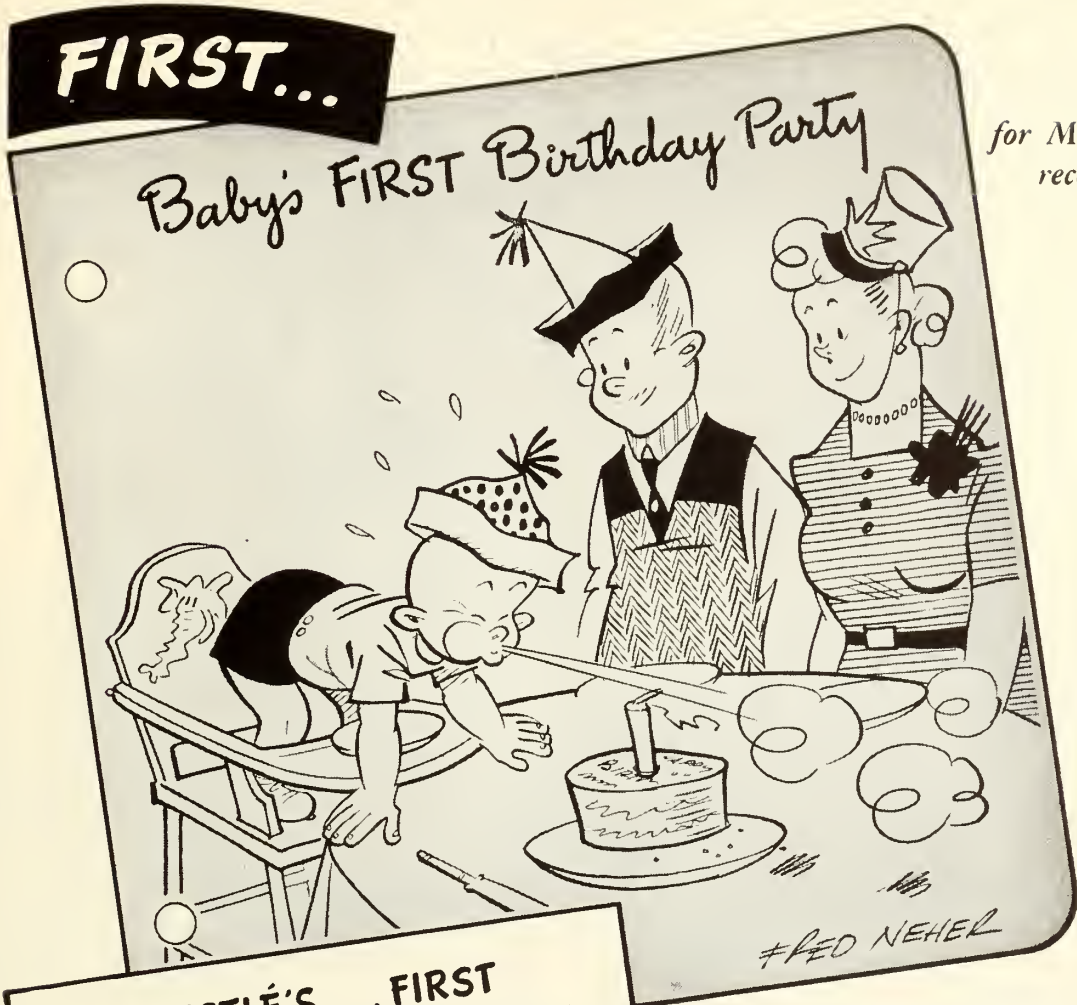
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FOLLOW UP RECORD

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infarction - improvedRESULT Recovered — Improved — Unimproved — DiedPERSONAL: Age 28Sex Male

M. W. D.

FAMILY HISTORY: NegativeHABITS: Non
smokerPAST HEALTH: GoodPRESENT CONDITION: on right
side

PHYSICAL E

TEMP. 97

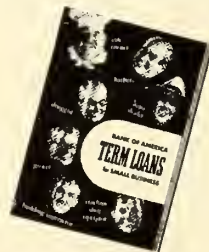
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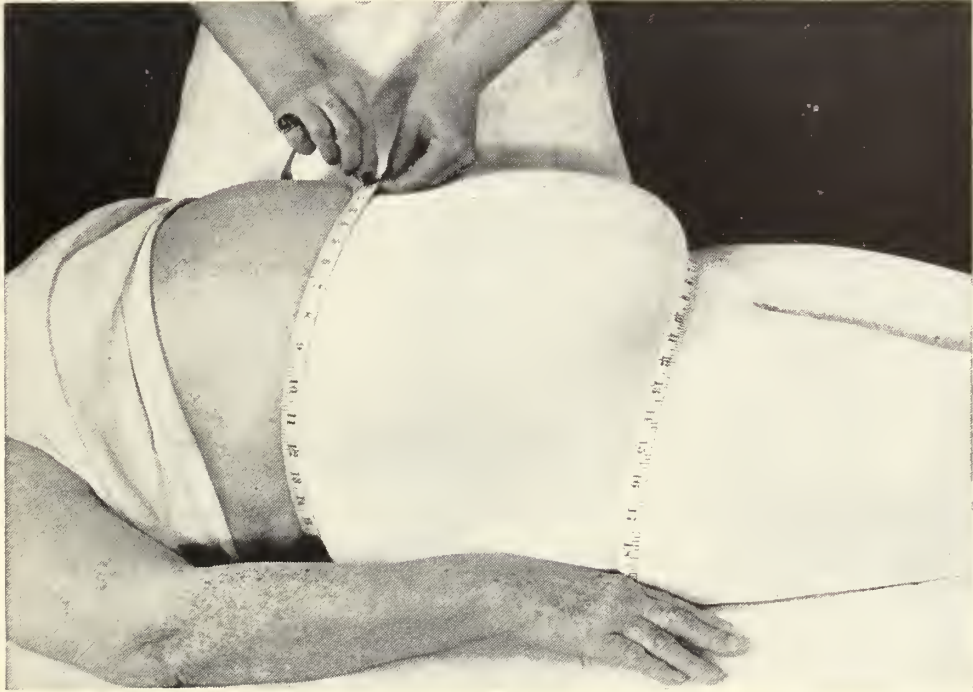
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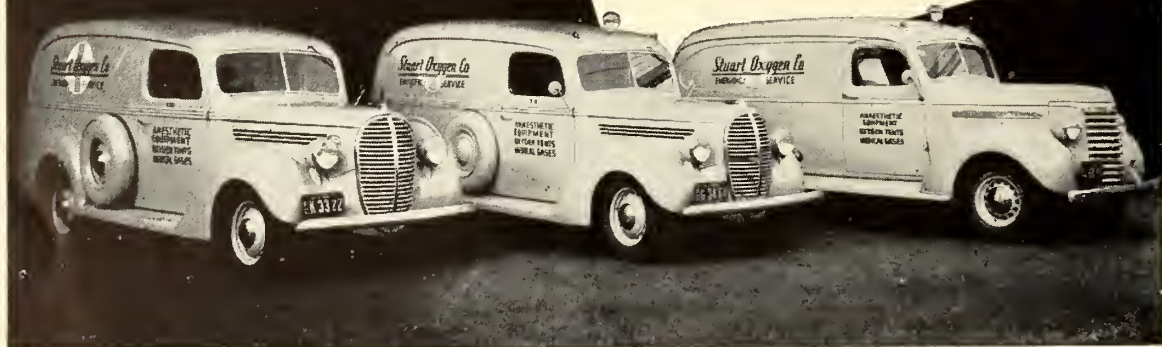
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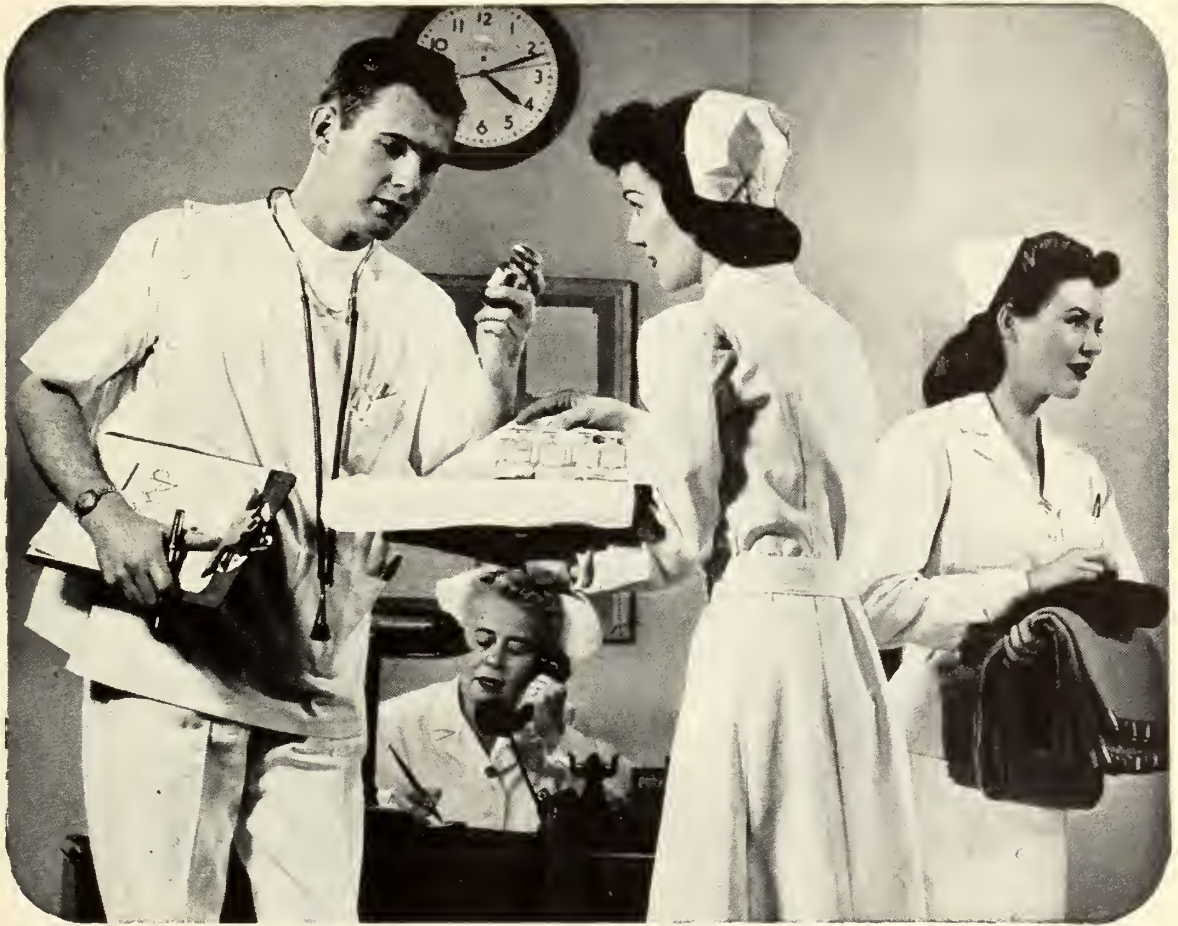
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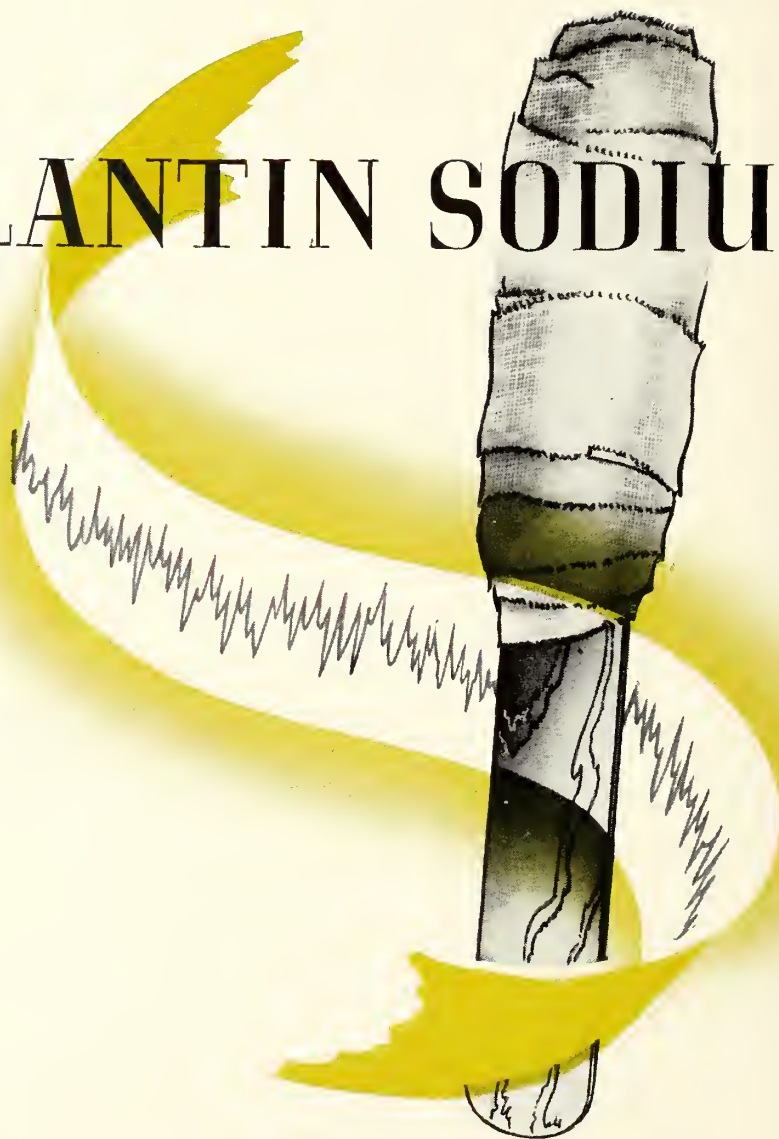
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Second District—Los Angeles County, Jay J. Crane (1948), 1921 Wilshire Boulevard, Los Angeles.	Sixth District—San Francisco County, Edwin L. Bruck (1949), 384 Post Street, San Francisco 2.	Councilors-at-Large
Third District—Inyo, Kern, Mono, San Luis Obispo, Santa Barbara and Ventura Counties, Harry E. Henderson (1949), 1421 State Street, Santa Barbara.	Seventh District—Alameda and Contra Costa Counties, Lloyd E. Kindall (1947), 400 Twenty-ninth Street, Oakland.	Walter S. Cherry (1948), 109 N. Riverside Ave., Rialto, San Bernardino County.
Fourth District—Calaveras, Fresno, Kings, Madera, Mariposa, Merced, San Joaquin, Stanislaus, Tulare and Tuolumne Counties, Axel E. Anderson (1947), Medical Group Building, 1759 Fulton Street, Fresno.	Eighth District—Alpine, Amador, Butte, Colusa, Eldorado, Glenn, Lassen, Modoc, Nevada, Placer, Plumas Sacramento, Shasta, Sierra, Sutter, Tehama, Yolo and Yuba Counties Frank A. MacDonald (1948), 822 Medico-Dental Building, 1127 Eleventh Street, Sacramento 14.	H. Gordon MacLean (1948), 230 Grand Avenue, Oakland.
		Sidney J. Shipman (1947), 490 Post Street, San Francisco 2.
		E. Earl Moody (1947), 829 South Alvarado Street, Los Angeles.
		C. V. Thompson (1949), 125 South Crescent Street, Lodi.
		Louis J. Regan (1949), 6777 Hollywood Boulevard, Los Angeles.

Standing Committees

Executive Committee		Committee on Publications	
The President, the President-Elect, the Speaker of the House of Delegates, the Chairman of the Council, the Chairman of the Auditing Committee, The Secretary-Treasurer (ex officio), and the Editor (ex officio).		F. Burton Jones.....Vallejo	1947
		R. H. Sundberg.....San Diego	1948
		George W. Walker (Chairman).....Fresno	1949
		L. Henry Garland.....ex officio	
		Dwight L. Wilbur.....ex officio	
Auditing Committee*		Committee on Public Policy and Legislation	
Sidney J. Shipman (Chairman).....San Francisco	1946	Dwight H. Murray (Chairman).....Napa	1947
Lloyd E. Kindall.....Oakland	1946	Lloyd E. Kindall.....Oakland	1948
H. Gordon MacLean.....Oakland	1946	E. T. Remmen.....Glendale	1949
Committee on Associated Societies and Technical Groups		Association President.....ex officio	
Anthony B. Diepenbrock (Chairman).....San Francisco	1947	Association President-Elect.....ex officio	
Edward F. Nippert.....Los Angeles	1948		
Peter Blong.....Alhambra	1949	Advisory Committee	
Committee on Health and Public Instruction		Junius B. Harris (Chairman).....Sacramento	
E. Earl Moody.....Los Angeles	1947	H. R. Madeley (Vice-Chairman).....Vallejo	
C. M. Burebfiel.....San Jose	1948	Wilson Stegeman.....Santa Rosa	
George M. Uhl (Chairman).....Los Angeles	1949	Committee on Scientific Work	
Committee on History and Obituaries		L. Henry Garland (Chairman).....ex officio	
Morton R. Gibbons, Sr. (Chairman).....San Francisco	1947	J. Homer Woolsey.....Woodland	1947
Robert A. Peers.....Colfax	1948	Howard F. West.....Los Angeles	1948
E. T. Remmen.....Glendale	1949	Clayton Mote.....San Francisco	1949
George H. Kress (Honorary Historian).....ex officio		Howard O. Dennis. (ex officio, Secretary, Section on Medicine)	
Committee on Hospitals, Dispensaries and Clinics		A. Morse Bowles.....(ex officio, Secretary, Section on Surgery)	
Clarence E. Rees (Chairman).....San Diego	1948	Committee on Public Relations	
Anthony J. J. Rourke.....San Francisco	1949	The Committee on Public Relations consists of the chairmen of the following standing committees and of certain general officers of the Association, all serving ex officio.	
Committee on Industrial Practice		George M. Uhl.....Chair., Com. on Health and Public Instruction	
N. P. Dunne.....Oakland	1947	Clarence E. Rees.....Chair., Com. on Hospitals, Dispensaries, Clinics	
Donald Cass (Chairman).....Los Angeles	1948	Donald Cass.....Chair., Com. on Industrial Practice	
J. B. Josephson.....San Jose	1949	William A. Key.....Chair., Com. on Medical Defense	
Committee on Medical Defense		Carl L. Mulfinger.....Chair., Com. on Organization and Membership	
Nelson J. Howard.....San Francisco	1947	H. Gordon MacLean.....Chair., Com. on Medical Economics	
William A. Key (Chairman).....San Mateo	1948	Dwight H. Murray, Chair., Com. on Public Policy and Legislation	
Louis J. Regan.....Los Angeles	1949	John C. Ruddock.....Chair., Com. on Postgraduate Activities	
Committee on Medical Economics		Sam J. McClendon.....President of California Medical Association	
Wayne J. Pollock.....Sacramento	1947	John W. Cline.....President-Elect	
H. Gordon MacLean (Chairman).....Oakland	1948	L. Henry Garland.....Secretary-Treasurer	
Howard W. Bosworth.....Los Angeles	1949	Communications for the Public Relations Department should be addressed to the Director, Mr. John Hunton, Room 2004, 450 Sutter Street, San Francisco 8.	
Committee on Medical Education and Medical Institutions		Cancer Commission	
B. O. Raulston (Chairman).....Los Angeles	1947	George Sharp.....Pasadena	1947
L. R. Candler.....San Francisco	1948	Whitfield Crane (Vice-Chairman).....Oakland	1947
Francis Scott Smyth.....San Francisco	1949	Gertrude Moore.....Oakland	1947
Committee on Organization and Membership		Henry J. Ullmann.....Santa Barbara	1948
Carl L. Mulfinger (Chairman).....Los Angeles	1947	David A. Wood (Sec'y, No. California).....San Francisco	1948
Harold G. Trimble.....Oakland	1948	James F. Rinebart.....San Francisco	1948
Henry A. Randel.....Fresno	1949	Lyell C. Kinney (Chairman).....San Diego	1949
Committee on Postgraduate Activities		L. Henry Garland.....San Francisco	1949
H. F. Freidell.....Santa Barbara	1947	Orville N. Meland (Sec'y, So. California).....Los Angeles	1949
John C. Ruddock (Chairman).....Los Angeles	1948	Physicians' Benevolence Committee	
Salvatore P. Lucia.....San Francisco	1949	Axel E. Anderson (Chairman).....Fresno	
L. Henry Garland.....ex officio		Elizabeth M. Hohl.....Los Angeles	
		Robert A. Peers.....Colfax	

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ROSTER OF COUNTY MEDICAL SOCIETIES, CALIFORNIA MEDICAL ASSOCIATION

(County society secretaries are requested to notify "California Medicine" promptly when changes are indicated in their roster information.)

Alameda County Medical Association
364 14th Street, Oakland 12
President, Warren B. Allen, 411 30th Street, Oakland 9.
Secretary, Dorothy M. Allen, 2923 Webster Street, Oakland 9.
Meeting, *Third Monday, 8:15 p. m., Hunter Hall, Oakland.*

Butte-Glenn County Medical Society
President, Hollis L. Carey, 567 Kentucky Street, Gridley.
Secretary, J. O. Chiappella, 131 Broadway, Chico.
Meeting, *Second Thursday.*

Contra Costa County Medical Society
President, George Kelso, 416 E. Fourth Street, Pittsburg.
Secretary, H. D. Neufeld, Box 338, Concord.
Meeting, *Second Tuesday, 8:00 p. m.*

Fresno County Medical Society
President, J. A. Thormann, Box 1908, Fresno.
Secretary, William L. Adams, Jr., 515 Helm Building, Fresno.
Meeting, *First Tuesday, University-Sequoia Club, Fresno.*

Humboldt County Medical Society
President, Walter Dolfini, 539 G Street, Eureka.
Secretary, Wayne P. McKee, Ferndale.
Meeting, *First Thursday.*

Imperial County Medical Society
President, Charles Cutshaw, Brawley.
Secretary, George Cole, Brawley.
Meeting, *Third Tuesday, 7:00 p. m., Barbara Worth Hotel, El Centro.*

Inyo-Mono County Medical Society
President, Walter L. Wilson, 108 N. Main, Bishop.
Secretary, Lloyd S. Bambauer, Bishop.
Meeting, *Fourth Wednesday, except December, January, February.*

Kern County Medical Society
President, William H. Macdonald, 2103 18th Street, Bakersfield.
Secretary, Frederick O. Wynia, 354 Habersfelde Building Bakersfield.
Meeting, *Third Tuesday, 7:30 p.m., Stockdale Country Club, except June, July, August.*

Kings County Medical Society
President, Lionel W. Sorenson, 1118 Whitley Avenue, Corcoran.
Secretary, William F. Chamlee, Van Sicklen Building, Hanford.
Meeting, *Second Monday, 8:00 p. m., Legion Hall, Hanford.*

Lassen-Plumas-Modoc County Medical Society
President, Wilbur C. Batson, Greenville.
Secretary, John Paul McKenney, Alturas.
Meeting, *On Call.*

Los Angeles County Medical Association
1925 Wilshire Boulevard, Los Angeles 5
President, Louis J. Regan, 6777 Hollywood Boulevard, Los Angeles 28.
Secretary, E. T. Remmen, 429 North Orange, Glendale 3.
Meeting, *First and Third Thursday, 1925 Wilshire Boulevard, Los Angeles.*

Marin County Medical Society
President, Lloyd G. Tyler, 1010 B Street, San Rafael.
Secretary, Carl W. Clark, 1010 B Street, San Rafael.
Meeting, *Fourth Thursday, 7:00 p.m., Travelers Inn, San Rafael.*

Mendocino-Lake County Medical Society
President, J. E. Gardner, 215 W. Standley Street, Ukiah.
Secretary, E. C. Bennett, Ukiah.

Merced County Medical Society
President, E. R. Fountain, Merced.
Secretary, C. C. Fitzgibbon, Shaffer Building, Merced.
Meeting, *Third Thursday, Hotel Tioga, Merced.*

Monterey County Medical Society
President, Margaret Swigert, Professional Building, Monterey.
Secretary, W. A. Carnazzo, M.D., 411 Alvarado Street, Monterey.
Meeting, *First Thursday.*

Napa County Medical Society
President, Charles H. Bulson, 1203 Seminary Street, Napa.
Secretary, M. M. Booth, Bruck Building, St. Helena.
Meeting, *First Wednesday.*

Orange County Medical Association
President, John Montanus, Rt. 1, Box 537A, Santa Ana.
Secretary, Russell I. Johnson, 181 Westminster Boulevard, Westminster.
Meeting, *First Tuesday, 7:00 p. m., Windsor Cafe, Santa Ana.*

Placer-Nevada-Sierra County Medical Society
President, George A. Foster, Grass Valley.
Secretary, Vernon W. Padgett, Grass Valley.
Meeting, *At Call of President.*

Riverside County Medical Society
President, Franklyn D. Hankins, 3014 Pine Street, Riverside.
Secretary, N. K. Bear, 3655 Fourteenth Street, Riverside.
Meeting, *Second Monday, 8:00 p. m., Library, Riverside Community Hospital.*

Sacramento Society for Medical Improvement
President, Frank Reardon, Physicians Building, Sacramento
Secretary, Edmund E. Simpson, 1127 Eleventh Street, Sacramento 14.
Meeting, *Third Tuesday, 8:30 p. m., Auditorium, Sacramento.*

San Benito County Medical Society
President, J. M. O'Donnell, Hollister.
Secretary, J. J. Haruff, Hollister.
Meeting, *At Call of President.*

San Bernardino County Medical Society
President, Carl M. Hadley, 315 Platt Building, San Bernardino.
Secretary, Thomas F. Dempsey, 1272 E Street, San Bernardino.
Meeting, *First Tuesday, 8:00 p. m., San Bernardino County Charity Hospital.*

San Diego County Medical Society
President, A. E. Moore, 2120 Fourth Avenue, San Diego 1.
Secretary, W. H. Geistweit, Jr., 810 Medical Building, 233 A Street, San Diego, 1.
Meeting, *Second Tuesday, University Club.*

San Francisco County Medical Society
2190 Washington Street 9
President, Chester L. Cooley, 490 Post Street, San Francisco 2.
Secretary, Robertson Ward, 2180 Washington Street, San Francisco 9.
Meeting, *Second Tuesday, 8:15 p. m., 2180 Washington Street, San Francisco, 9.*

San Joaquin County Medical Society
President, Dora Ames Lee, 110 North San Joaquin Street, Stockton 6.
Secretary, H. D. Chope, Box 111, Stockton.
Meeting, *First Thursday, 8:15 p. m., Medico-Dental Club Rooms, Stockton.*

San Luis Obispo County Medical Society
President, Edward C. Sherman, 784 Marsh Street, San Luis Obispo.
Secretary, G. D. Kelker, 1114 Marsh Street, San Luis Obispo.
Meeting, *Fourth Wednesday, 6:30 p. m., Gold Dragon Cafe, San Luis Obispo.*

San Mateo County Medical Society
President, A. G. Miller, 205 Third Avenue, San Mateo.
Secretary, J. Paul Sweeney, 727 Cordillero Avenue, San Carlos.
Meeting, *Third Tuesday of each month.*

Santa Barbara County Medical Society
President, Alfred B. Wilcox, 1515 State Street, Santa Barbara.
Secretary, Charles A. Preuss, 1317 Santa Barbara Street, Santa Barbara.
Meeting, *Second Monday, Cottage Hospital.*

Santa Clara County Medical Association
President, Charles A. Farnish, 226 Salazar Building, San Jose 23.
Secretary, Fred W. Borden, Sainte Claire Building, San Jose, 23.

Santa Cruz County Medical Society
President, Ruth A. Frary, 123 East Third Street, Watsonville.
Secretary, Samuel B. Randall, 84 Walnut Avenue, Santa Cruz.
Meetings: *February, April, October, and December. Time and place to be decided by the President.*

Shasta-Trinity County Medical Society
President, L. C. Mosher, Bieber.
Secretary, Julius M. Kehoe, Redding.
Meeting, *Second Monday.*

Siskiyou County Medical Society
President, Richard W. Jones, 106 South Broadway, Yreka.
Secretary, F. W. Martin, Mt. Shasta.
Meeting, *Sunday on Call.*

Solano County Medical Society
President, John W. Green, Box 539, Vallejo.
Secretary, Clark T. Alexander, 731 Sonoma Street, Vallejo.
Meeting, *Second Thursday, 8:00 p. m., Casa de Vallejo; Hotel Vallejo.*

Sonoma County Medical Society
President, William Stegeman, 534 B Street, Santa Rosa.
Secretary, Raimond F. Clary, 1616 Fourth Street, Santa Rosa.
Meeting, *Second Thursday.*

Stanislaus County Medical Society
President, J. Lyle Spellman, P. O. Box 1412, Modesto.
Secretary, Richard R. Treadwell, P. O. Box 801, Modesto.
Meeting, *Second Friday, 7:30 p.m., Hotel Hugson.*

Tehama County Medical Society
President, E. R. Wilson, Red Bluff.
Secretary, R. G. Frey, Red Bluff.
Meeting, *At Call of President.*

Tulare County Medical Society
President, George Kelper, Bank of America Building, Visalia.
Secretary, Irvin H. Betts, 222 West Willow Street, Visalia.

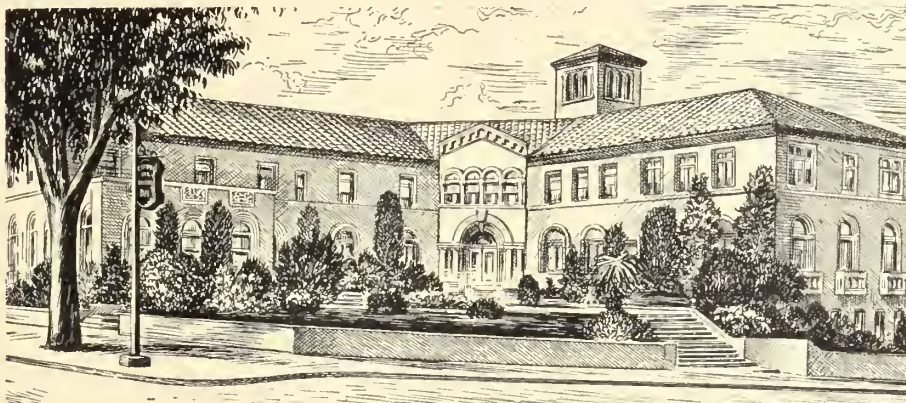
Ventura County Medical Society
President, A. W. Cruden, Saticoy.
Secretary, George H. Arnold, Route 2, Box 12, Ventura.
Meeting, *Second Tuesday, Ventura County Country Club.*

Yolo County Medical Society
President, Charles S. Roller, 604 Woodland Avenue, Woodland.
Secretary, Emery Leivers, Woodland Clinic, Woodland.
Meeting, *First Wednesday.*

Yuba-Sutter-Colusa County Medical Society
President, Leon M. Swift, Box 244, Marysville.
Secretary, D. Ermorlie Edwards, 725 Fourth Street, Marysville.
Meeting, *Second Wednesday.*

(For roster of C.M.A. committees and other organization, see last month's issue.)

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REWARD OFFERED—For information leading to the recovery of the following stolen articles: Zeiss Monocular Microscope (Short model with rotating and detachable cylinder and eye-piece); Thoma-Zeiss Hemacytometer, 120 surgical instruments marked ETR or R; Contax Camera with Sonnar lens number 2-230-994. E. T. Rulison, M.D., Box 402, Route 3, Santa Cruz, California.

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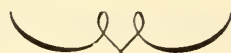
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ANTISPASMODICS



MUSICAL NOTES ON V.D.

"Lues"—the medical man's term for syphilis, explained the Medical Corps major speaking to the G.I.'s assembled in a camp theatre for a lecture and training film on venereal disease—"Lues is bad business. Lues is a disease any of us might get. Lues untreated is dangerous to yourselves and others. Lues can almost always be cured by early treatment."

The major sat down, the house was darkened and the showing of the film started. After a minute or two of the pictured horrors of syphilis and warnings that it lurked almost everywhere, a soldier brought down the house by raising a passable barytone into the quiet darkness with the words of a once popular song, "Every little breeze seems to whisper Louise."

—Contributed by G.I., Berkeley.

HOT OPERA

"Lily Pons Here to Sing Lakme," headlined the *San Francisco Chronicle*, whose reporter went on to say that "between smiles, she kissed Raoul Jabin, who will sing opposite her."

LESS TO THIS THAN MEETS THE EYE

A man of our acquaintance reports that his eight-year-old niece, a perspicacious young lady, recently confronted him with a test of his powers of observation. She told him she had noticed there is something which a man does standing up, a woman sitting down, and a dog standing on three legs. Making a riddle of it, she asked him to supply the answer.

She waited eagerly while he pondered uncomfortably, and when after a few moments she asked, "Do you give up?" he readily did so.

"It's shaking hands," she told him.

—Contributed by H.E.O., San Francisco.

University of California scientists have demonstrated beyond doubt that the growth hormone alone is responsible for growth.—U. C. *Clip Sheet*.

Yeh? What about Adler shoes?

—Contributed by F.K., San Francisco.

SAY "AH, !"

"State Doctor: 'Now just sit up in bed and sign here and here and here. And fill out this form. And get three neighbors to vouch for it. And remember the pains and penalties of perjury! Then I'll look at your tongue.'"—*Pathfinder Magazine*.

Hidebound

A book bound in human skin is one of the rare volumes in the library of the Los Angeles campus of the University of California.—U. C. *Clip Sheet*.

Rare, Mr. Hearst, not raw, which is an entirely different matter.

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+MALTOSE—9.6 GM.

+DEXTROSE—4.2 GM.

+DEXTRINS—10.2 GM.

+PHOSPHORUS—279 MG.

+CALCIUM—303 MG.

+CHOLINE*—36 MG.

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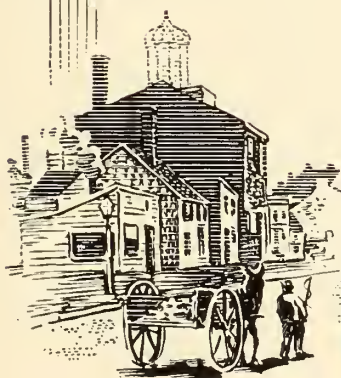
Founder of the first medical school affiliated with any college or university in this country—the Medical School of the College of Philadelphia, now the Medical Department of the University of Pennsylvania.

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*LaWall, C. H.: Four Thousand Years of Pharmacy. An Outline History of Pharmacy and the Allied Sciences. Philadelphia, J. B. Lippincott Company, 1927; p. 403.

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1. Montgomery, J. B.: *M. Clin. North America* 29:205 (Nov.) 1945.

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DOCTOR URGES HEART PATIENTS TO LIVE NORMAL, USEFUL LIVES

A Philadelphia physician states that many patients who have serious complications of the heart can be reassured and allowed to live normal lives, according to the October 19 issue of *The Journal of the American Medical Association*.

William D. Stroud, M.D., who is on the board of directors of the American Heart Association, points out that there are "many murmurs, especially in the pulmonic area, which are absolutely of no importance from the standpoint of circulatory efficiency or length of life. In fact, many children with definite valvular damage live the full span of life and others do not develop circulatory insufficiency until the third, fourth or fifth decade. Certainly their lives can be much happier if their physical activities are unrestricted and I doubt whether the normal physical activity of childhood plays any part in the progress of the pathologic lesion."

Medicine can aid patients with heart trouble to lead practical normal lives, according to Dr. Stroud. "Most people with coronary insufficiency know the things that bring on pain, such as walking after meals or in cold weather against the wind," he states. "If it is necessary for these persons to make such effort, it is perfectly possible for them to ward off an attack by dilating the coronary vessels with a tablet of glyceryl trinitrate before making such an effort."

Dr. Stroud is of the opinion that patients with heart trouble should be permitted to smoke and drink.

"Most people who smoke know whether or not they are sensitive to nicotine," he said. "If a man is not sensitive to nicotine, I believe it is perfectly safe for him to smoke. However, sensitive or not, in the presence of angina of effort or a healed coronary occlusion if a person is having substernal pain I believe eliminating tobacco will tend to lessen the frequency of attacks of pain."

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Bone Biopsies on these huskies?



1. Moore, C. U., Brodie, J. L., Thornton, A. J., Lesem, A. M., Cordua, O. B.: Failure of Abundant Sunshine to Protect Against Rickets, *Am. J. Dis. Child.*, 64: 1227-28, (Dec.) 1937.

2. Follis, R. H. Jr., Jackson, D., Elliot, M. M., Park, E. A.: Prevalence of Rickets in Children Between Two and Fourteen Years of Age, *Am. J. Dis. Child.*, 66:1-11 (July) 1943.

3. Kugelmass, I. N.: Newer Nutrition in Pediatric Practice, p. 656. Lippincott, Philadelphia, 1940.

- ... on the *prevalence* of rickets: 90% of 943 apparently "normal" pre-school children presented signs of rickets.¹
- ... on the *age* affected by rickets: 46.5% of 230 children aged 2 to 14 revealed histologic evidence of rickets, with a high of 62% in the 10 to 11 year group.²
- ... on the need for better *protection*: "Older children require prophylactic doses of vitamin D until maturity, especially during the periods of rapid growth."³

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The ninety-fifth convention of the A.M.A. is now a matter of medical history and its outstanding success a matter of record.

John W. Cline, Chairman of the General Committee, described the results in a letter of thanks to subcommittee chairmen. He said:

"The comments of delegates and visitors from other states have been highly complimentary to the San Francisco County Medical Society. The splendid arrangements for the convention and the warm hospitality extended to the visiting physicians were greatly appreciated. The Society and its officers have received numerous letters expressing the gratitude of the visitors, especially from members of the House of Delegates."

The credit goes to the members of the Society who handled the many details of the program, according to Dr. Cline. An equal share of the credit, he pointed out,

goes to the hundreds of members of this Society who contributed their financial support, as well as to the other county societies in California, the hospitals and the business firms who donated substantial amounts of money to help defray the cost of entertaining our guests.

Receipts Tabulated

Here are the detailed figures on receipts:

335 Members—

S. F. County Medical Society.....	\$10,033.00
Business Firms	3,000.00
Other County Medical Societies of Calif.....	2,216.50
Hospitals	1,428.00

Total Receipts\$16,677.50

Following are the county medical societies who contributed sums ranging up to \$1,000:

(Continued on Page 22)

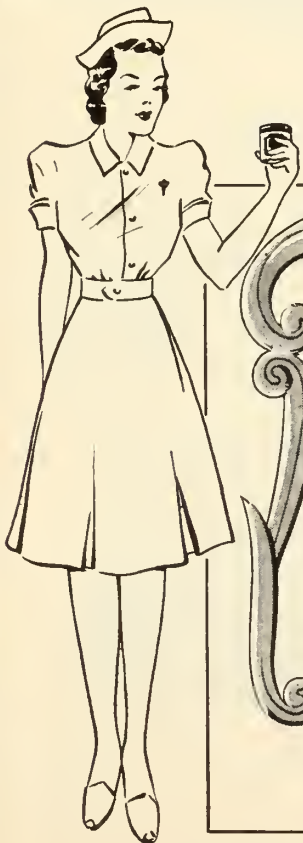
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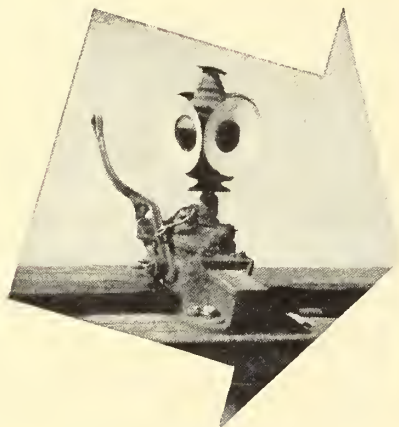
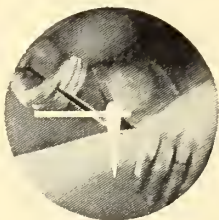
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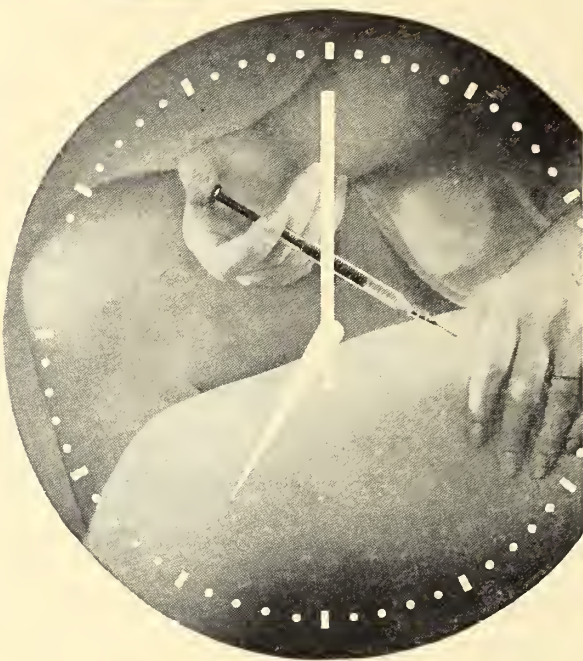
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(Continued on Page 30)

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Following are the hospitals who donated amounts ranging up to \$500.

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macy, Broemmel's Pharmacy, Broemmel's Prescription Pharmacy, California Brewer's Institute, City of Paris, Don Baxter, Inc., Eli Lilly Company, Grace Line, Inc., Guy's Prescription Pharmacy, Matson Navigation Company, Mead Johnson & Company, Medical Arts Pharmacy, Medico-Dental Pharmacy, Merck & Company, Parke Davis & Company, Ransohoff's, Upjohn Company, Winthrop Chemical Company, Inc., Yellow Cab Company.

Thanks Expressed

The officers and directors of the San Francisco County Medical Society, the chairmen and men and women of the A.M.A. Convention committees, take this opportunity of thanking each of the 335 loyal members of the Society whose financial contributions insured the success of the convention. The Society also wishes to express its deep appreciation to the component county societies, the hospitals and business firms listed above, and to assure them that their generous support and cooperation will be remembered and reciprocated.

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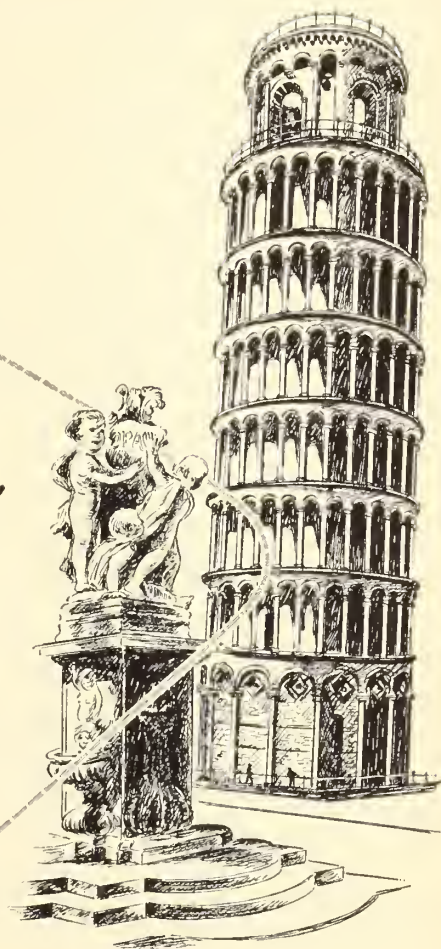
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The author—Charles I. Thomas, M.D., from the Department of Surgery, Division of Ophthalmology, Western Reserve University School of Medicine—used the eyes of rabbits for his experiment.

"Corneal tissue will remain clear and of normal thickness and can be used suitably for transplantation up to a period of three days," he states. "Thereafter the tissue becomes progressively hazy and thickened, being thus rendered unsuitable for grafting."

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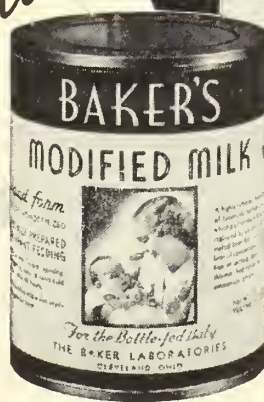
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(Continued on Page 42)



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1. Gold, H.: Connecticut M. J. 9:3 (Mar.) 1945.
2. Levine, Samuel A.: Clinical Heart Disease, ed. 3, Philadelphia, W. B. Saunders Company, 1945, p. 273.
3. Gold, H.; Kwit, N. T.; Cattell, M., and Traveli, J.: J.A.M.A. 119:928 (July 18) 1942.
4. Gold, H.; Cattell, M.; Modell, W.; Kwit, N. T.; Kramer, M. L., and Zahm, W.: J. Pharmacol. & Exper. Therap. 82:187 (Oct.) 1944.



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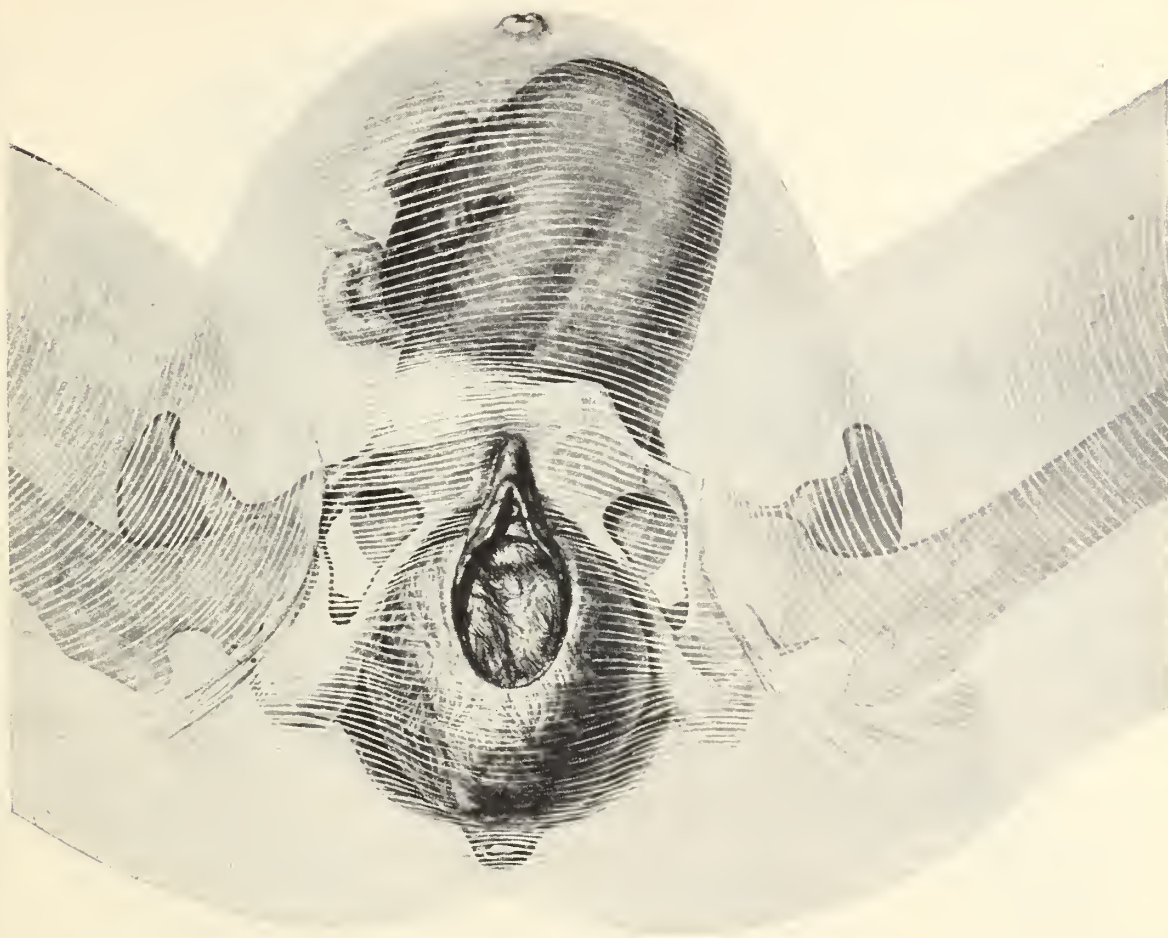
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*Stare, F. J., and Thorn, G. W.: Protein Nutrition in Problems of Medical Interest, J. A. M. A. 127:1120 (April 28) 1945.

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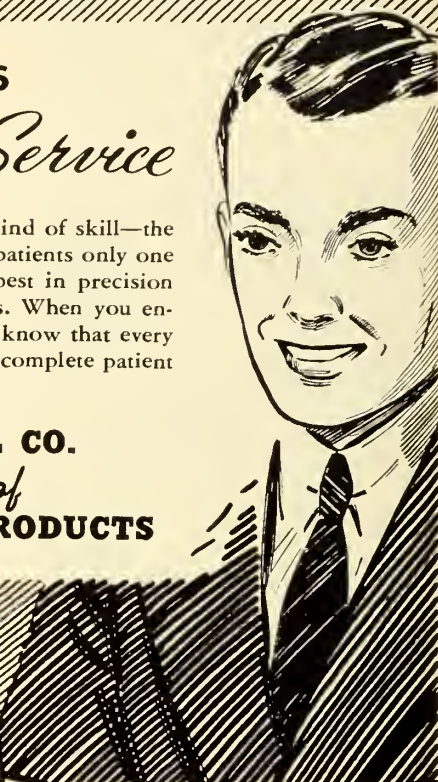
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1. Am. J. Surg. 44:288 (April) 1942.

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Scarano, J. A., and Coppolino, J. F.: Arch. Pediat. 54:97

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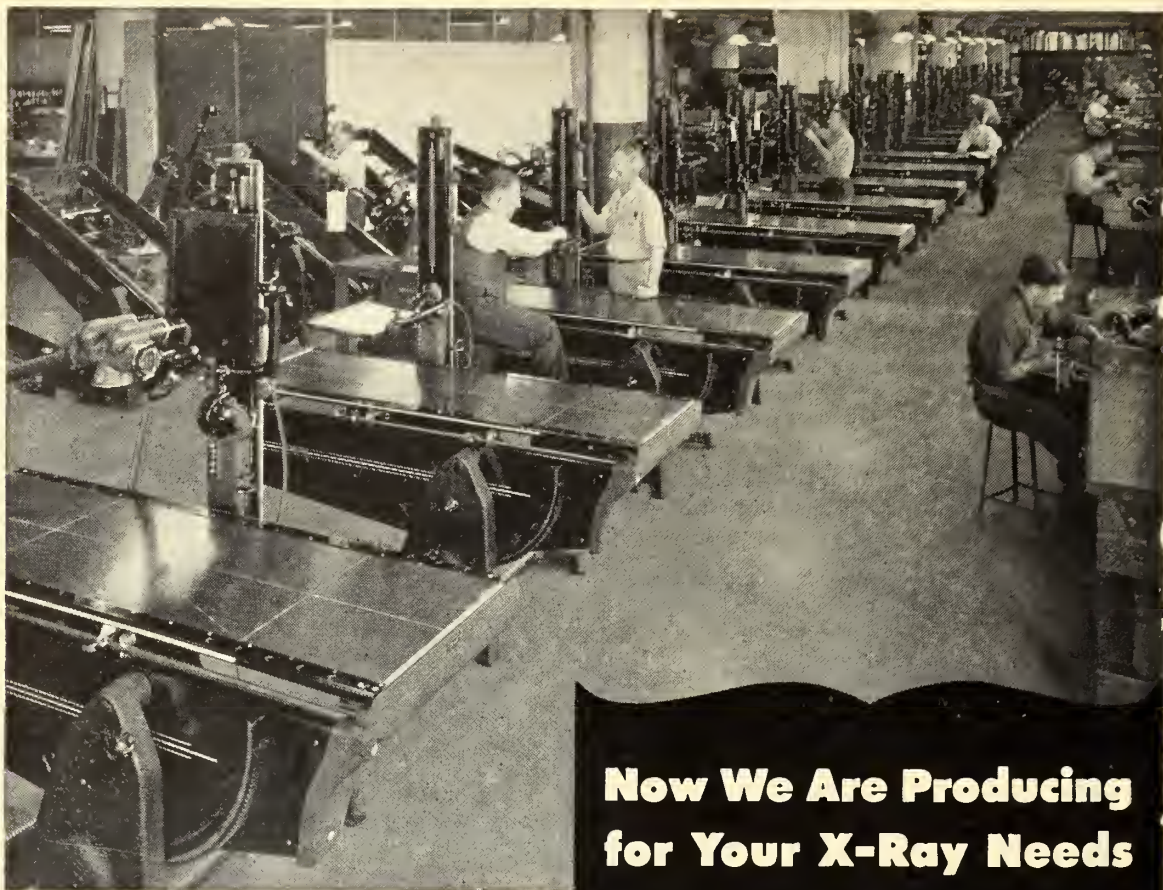


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a better means of nasal medication

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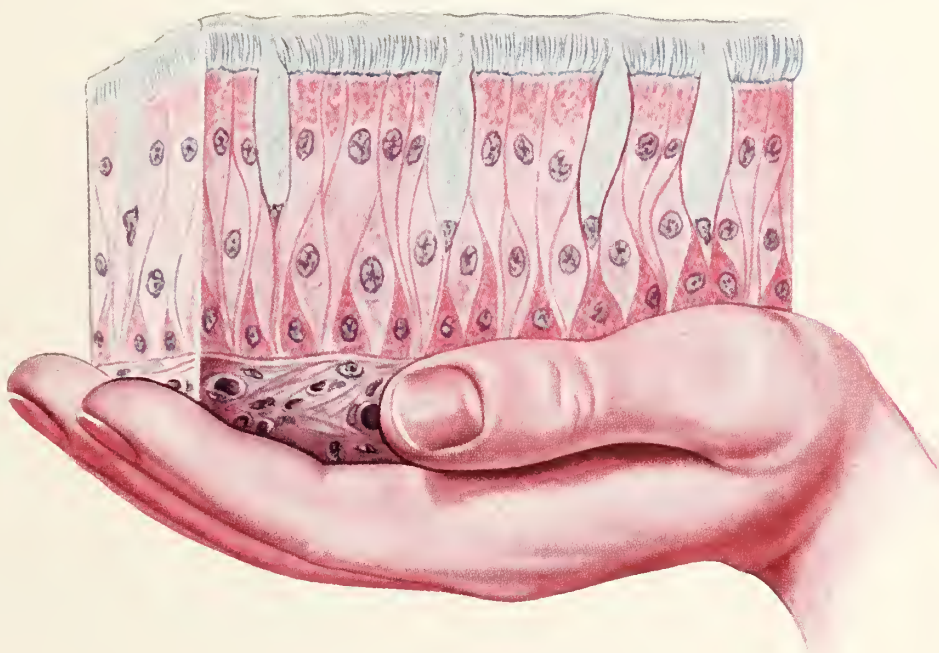
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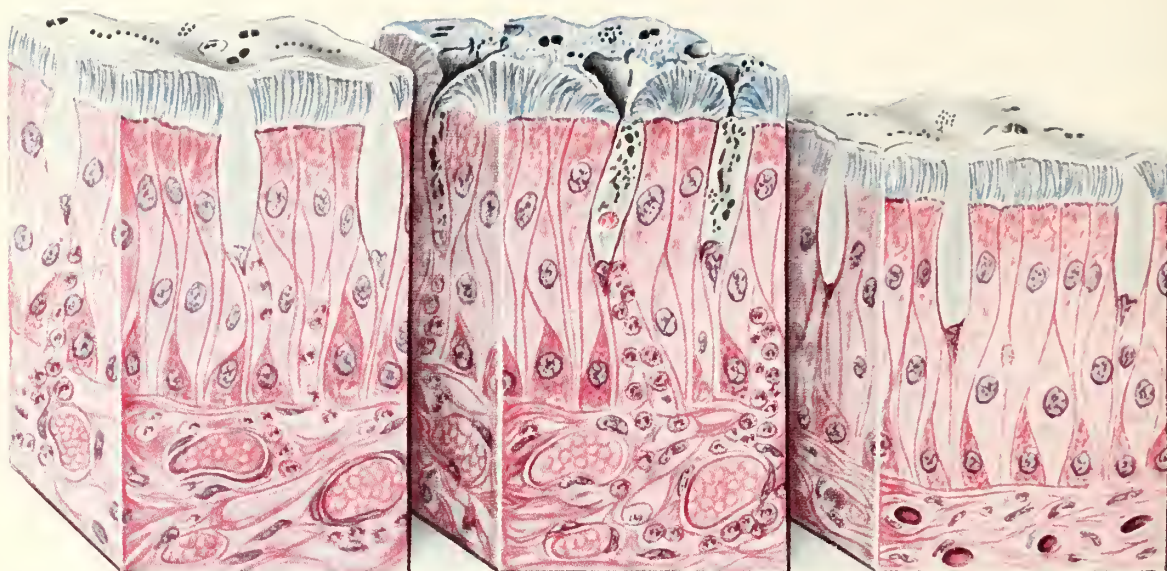


PROMPT, LONG-LASTING DECONGESTION

Privine Hydrochloride promptly shrinks congested nasal mucous membranes, inducing a vasoconstrictive action which lasts for several hours. In itself, this basic action gives Privine a wide field of usefulness. Other important qualities have gained for Privine its pre-eminent position in the field of nasal therapy.

Fulfills Criteria for Nasal Application. Whether used alone to secure prolonged reduction of local swelling, thus facilitating drainage, or as an adjunct in support of other measures, Privine meets the prime criteria for a vasoconstrictor. The ideal nasal medication should not interfere with the continuity of the thin blanket of mucus kept moving by the action of the cilia. Privine, being prepared in an isotonic, aqueous solution buffered to a pH of 6.2 to 6.3, avoids artificial differences of osmotic pressure inside and outside the cells of the nasal epithelium. Compatibility with the mucosa has been assured by numerous studies of the effect of Privine on ciliary activity. It has repeatedly been shown that Privine leaves uninhibited the eliminative action of the cilia on bacteria and dust deposited on the mucous membrane.

CIBA



1 Congested Mucosa. Schematic illustration showing the congested and moderately inflamed nasal mucous membrane.

2 Destruction of Cilia. Highly alkaline preparations, powerful astringents and protein precipitants may interfere with ciliary activity.

3 Decongestion Without Injury. Privine induces prompt decongestion lasting for hours, but has no harmful effect on normal activity of the cilia.

Vasoconstriction Without Damage

Approximates Normal Nasal pH. Privine has a slightly acid physiologic pH buffered to a range of 6.2 to 6.3. This is reported by Tweedie¹ and by Fabricant^{2,3} as being within the normal range of the nasal secretions. The usual lack of stinging and burning following the clinical application of Privine seems to bear out the contention that its pH closely approximates that of the normal nasal mucus.

Minimal Side Effects. Privine is singularly free from effects injurious to nasal and sinus mucous membranes, as attested by many authors. As with any other vasoconstrictor, secondary congestion may arise after prolonged, continuous use. However, as Scheer⁴ states, "By means of periodic check-up and appropriate advice, patients have been discouraged from using Privine or any other nasal vasoconstrictor over too prolonged a period. As a result of these combined measures, we have reduced the incidence of secondary congestion to the vanishing point."

Absorption and local side effects from use of Privine are minimal. New and Non-Official Remedies states: "So far, there have been no reports proving that sufficient drug is absorbed following local application to increase the blood pressure, although this possibility should not be forgotten." In infants and young children, a sedative effect has been noted in a few cases, usually after gross overdosage. No after-effects have been reported.

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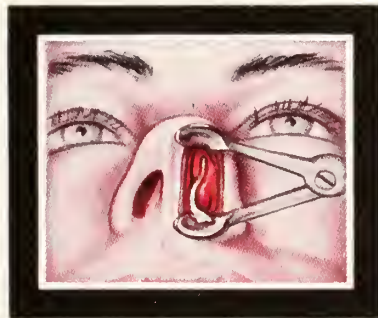


Describing the actions and uses of Privine, New and Non-Official Remedies states: "It is of value in the symptomatic relief of disorders of the upper respiratory tract such as nasal congestion of allergic and inflammatory origin, acute and chronic rhinitis, vasomotor rhinitis and acute and chronic rhinosinusitis."

Privine lends itself to any of the conventional methods of office application in both child and adult . . . by tampon, spray, drop, displacement, or sinus instillation. Its use over a period of years has demonstrated it to be highly suitable for medication between office visits, using 2 to 3 drops of solution in each nostril or a small amount of Privine Jelly.



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Ethmoidal Sinusitis



Maxillary Sinusitis



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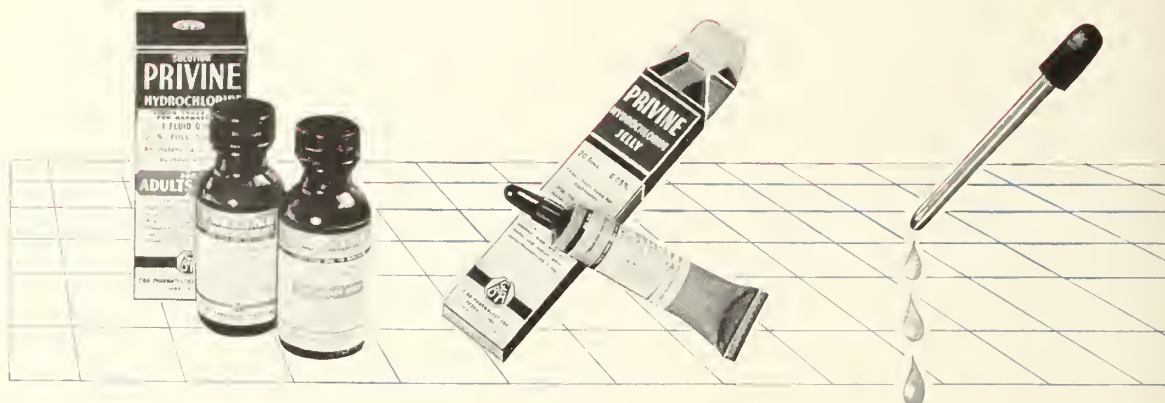
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Solution PRIVINE Hydrochloride 0.1%, bottles of 30 and 480 cc.
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PRIVINE Nasal Jelly 0.05%, tubes of 20 grams.

- BIBLIOGRAPHY:**
1. Tweedie, A. R.: J. Laryng. & Otol., 49: 586, 1934.
 2. Fobricont, N. D.: Arch. Otol., 33: 150, 1941.
 3. Fobricont, N. D.: Arch. Otol., 41: 53, 1945.
 4. Scheer, H. M.: New York State J. Med., July 1, 1946.



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You've probably heard some such remark in recent years. Actually it's only a partial truth. While medicine has made wonderful gains in its struggle with pneumonia, the disease can still be critical or even fatal—and you owe it to yourself to have up-to-date information about it.

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There are a number of different kinds of pneumonia. By laboratory tests, X-rays, or other diagnostic methods, your doctor can tell which kind a patient has. He can then determine which, if any, of the new infection-fighting drugs should be used.

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1. *Pneumococcus pneumoniae*

In most years, the majority of pneumonia cases in the United States are caused by organisms of the pneumococcus family. There are about 40 types of pneumococci—of both—have been found effective against all these 40 types.

2. *Streptococcus pneumoniae*

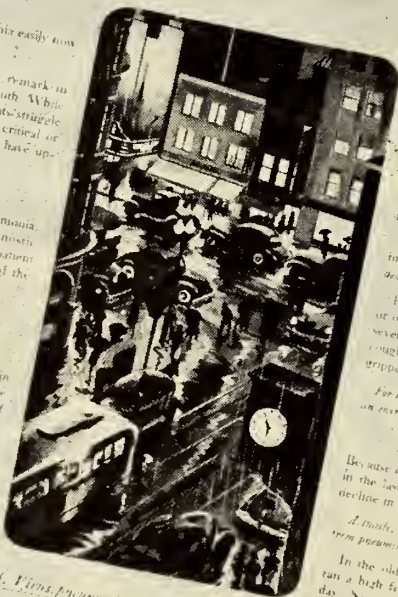
Organisms of the streptococcus family can also cause pneumonia. Your doctor can fight them, too, with one of the new drugs, penicillin or other anti-infectives.

3. *Friedlander's pneumonia*

This is brought on by an organism known as Friedlander's bacillus. Neither sulfa nor penicillin is effective, but streptomycin—a new drug, not yet generally available—has been successfully used in some cases.

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killing drugs; and in these cases prompt action and careful nursing are especially important.

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In spite of the effectiveness of the new drugs against most kinds of pneumonia, your doctor would rather help you prevent the disease than cure it.

There is no vaccine that has proved satisfactory in immunizing against pneumonia. But there is a great deal you can do to avoid getting it.

Pneumonia often attacks a person who is run-down or over-tired, or who has had grippe, influenza or a severe cold. So if you have a cold with fever or a cough that hangs on, or if you suspect you have grippe or influenza—call your doctor.

For by staying at home through these less severe ailments, you can markedly reduce your risk of contracting pneumonia.

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At birth, less than half as many Americans die from pneumonia as in 1914.

In the old days, the average pneumonia patient ran a high fever until the seventh, eighth or ninth day. Now, however, your doctor may be able to reduce your fever to normal within 24 hours.

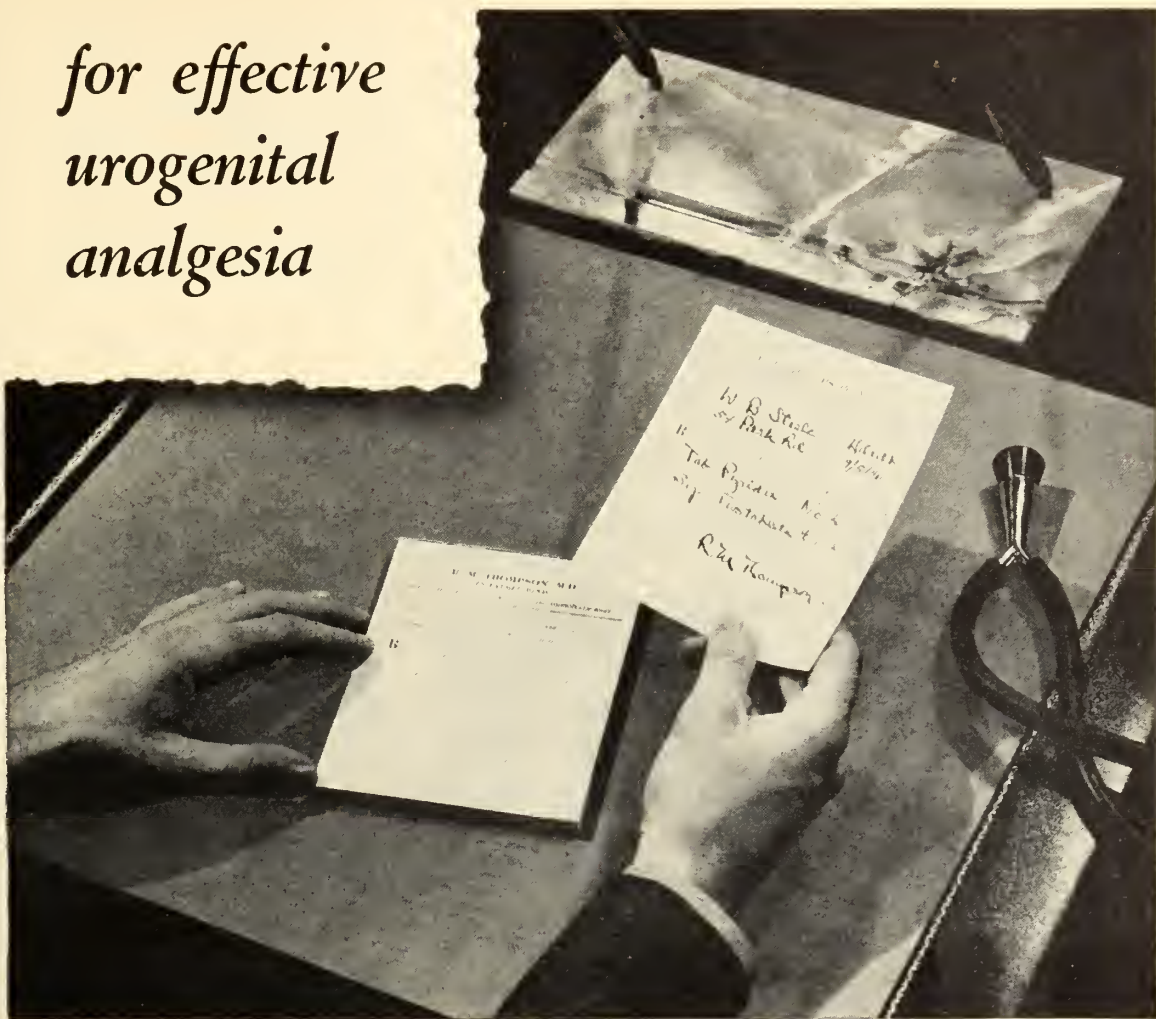
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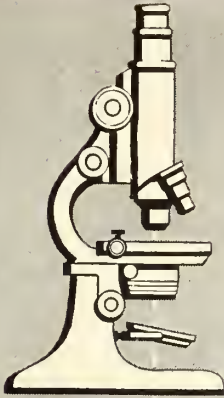
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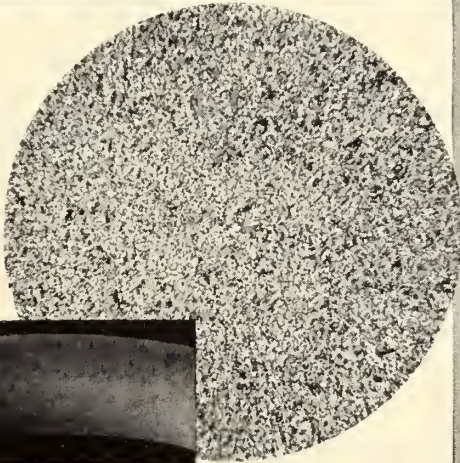
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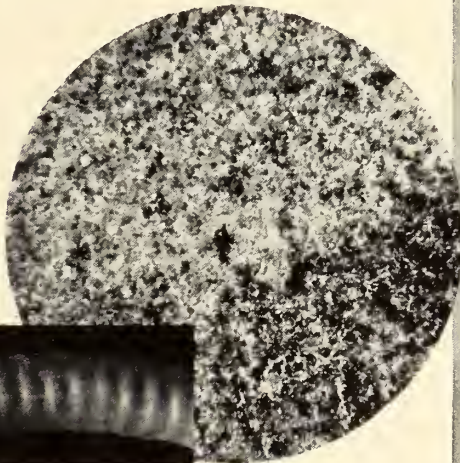
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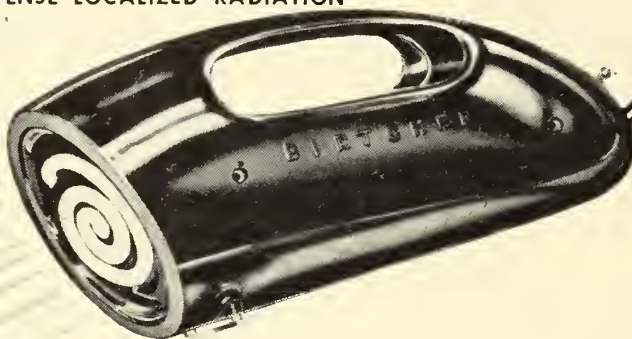
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*R. H. Follis, D. Jackson, M. M. Eliot, and E. A. Park: Prevalence of rickets in children between two and fourteen years of age, *Am. J. Dis. Child.* 66:1-11, July 1943.

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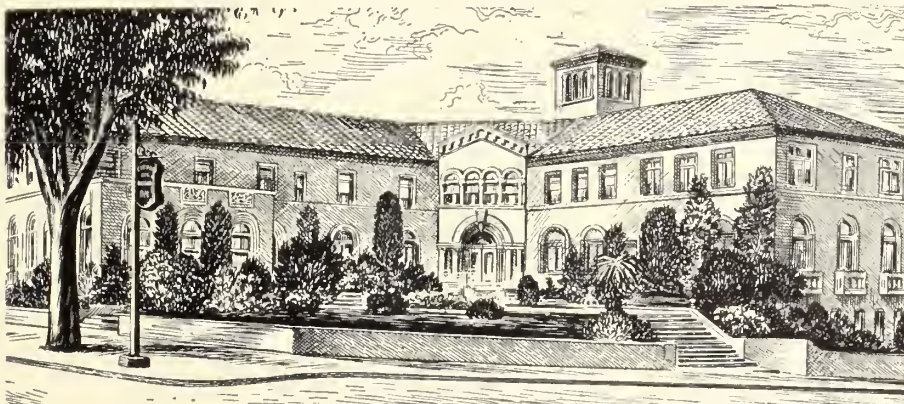
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(Continued from Page 8)

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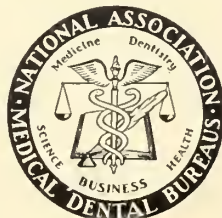
Official Magazine of the Chamber of Commerce of the United States

► "SOCIALIZED MEDICINE gets a body blow from current scientific survey of state medicine in Russia, Germany, England and New Zealand, published by U. S. doctors and dentists opposed to Wagner-Murray-Dingell bill.

To place all doctors, dentists and hospitals under federal bureaucratic control, the study concludes, would be to drop American standards of health and welfare into "the appalling quagmire of mediocrity in which we now find it in Germany, England and Russia after years of political medicine."

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CONSIDER PHYSICAL MEDICINE SEPARATE MEDICAL SPECIALTY

Physical medicine has progressed to such a degree that it must be considered a separate and distinct medical specialty, according to an article in the November 9 issue of *The Journal of the American Medical Association*.

The author, George Morris Piersol, M.D., of Philadelphia, urges the practicing physician to avail himself of the "experience and advice" of the physiatrist in the same way he avails himself of the services of the roentgenologist, the gastroenterologist, the surgeon and other qualified specialists. The physiatrist is a new term applied to physicians who are qualified to employ the physical and other effective properties of light, heat, cold, water, electricity, massage, manipulation, exercise and mechanical devices for physical and occupational therapy in the diagnosis and treatment of disease.

"Closer cooperation and better understanding between the general practitioner and the specialist in physical medicine must be fostered," Dr. Piersol says, "if the large number of patients who need physical therapy are to receive the most effective treatment."

Dr. Piersol, who is from the Center for Instruction and Research in Physical Medicine at the University of Pennsylvania, believes that the public is "acutely interested in the worldwide problem" of rehabilitation, which has been defined as the restoration of the handicapped to the fullest physical, mental, social, vocational and economic usefulness of which they are capable.

"Thousands of veterans returning to various communities are suffering from, and many will continue for years to suffer from, injuries and disabilities which require for their proper management physical and occupational therapy. . . . Those veterans who, during their service experience, have learned the value of physical therapy will be justified in insisting on a continuation of such treatment from their family physician.

"It is a mistake to think that problems of reeducation or reconditioning are limited to disabilities incurred as the result of war. In a great nation such as this, in which the bulk of the population comprises workers engaged in all forms of activity, the annual toll of industrial accidents far exceeds the number of the battle casualties of any war. When to this figure is added the appalling number of traffic accidents and the indeterminate number of nonindustrial accidents that occur in the home or elsewhere, the toll of civilian injuries that sooner or later require some form of reeducation reaches a staggering total. In 1940 industrial injuries alone were listed at 1,890,000. The loss of time as a result of these injuries, if deaths and permanent disabilities are included, is estimated at 233,840,000 working days, the equivalent of the full time work of 780,000 workers."

Specialists in the field point out that rehabilitation through physical therapy, occupational therapy, physical training and educational and recreational programs fills the gap between the customary end point of medical attention and the real necessities of many patients.

Dr. Piersol says that reluctance to employ physical forms of treatment is "in no small degree based on widespread misconceptions of what is involved in this type of therapy. It is believed that effective physical therapy requires the use of complicated and expensive apparatus. The experience of a department of physical medicine in a general hospital shows that the contrary is true.

"As is the case with all therapeutic agents that bring about definite physiologic reactions, the procedures employed in physical medicine are capable of doing harm

(Continued on Page 18)

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CONSIDER PHYSICAL MEDICINE SEPARATE MEDICAL SPECIALTY

(Continued from Page 14)

as well as good. Not only is it essential to select the proper procedure or combination of procedures, but their dosage must be regulated in regard to intensity, duration and frequency. Disappointing and at times harmful results have frequently been recorded because of lack of attention to or ignorance of these details."

On the basis of a survey of the prescriptions which referring physicians sent to a department of physical medicine, Dr. Piersol found that 57 per cent of the conditions were represented by chronic arthritis, neuromuscular pains of undiagnosed origin, strains and fractures.

EARLY VITAMIN DEFICIENCY STILL POSES PROBLEM TO MEDICAL SCIENCE

Although health education and commercial advertising have made the American public diet and vitamin conscious, medical science is still faced with the problem of detecting and treating early vitamin deficiency states, according to David Cayer, M.D., of Winston-Salem, N. C.

Writing in the November 9 issue of *The Journal of the American Medical Association*, Dr. Cayer, who is from the Department of Internal Medicine, Bowman Gray School of Medicine of Wake Forest College, says that it is very difficult to recognize early vitamin deficiency states when physical signs are absent. These include night blindness, spongy bleeding gums, painful joints and sore tongue and mouth.

Symptoms alone are not an accurate guide for diag-

(Continued on Page 22)

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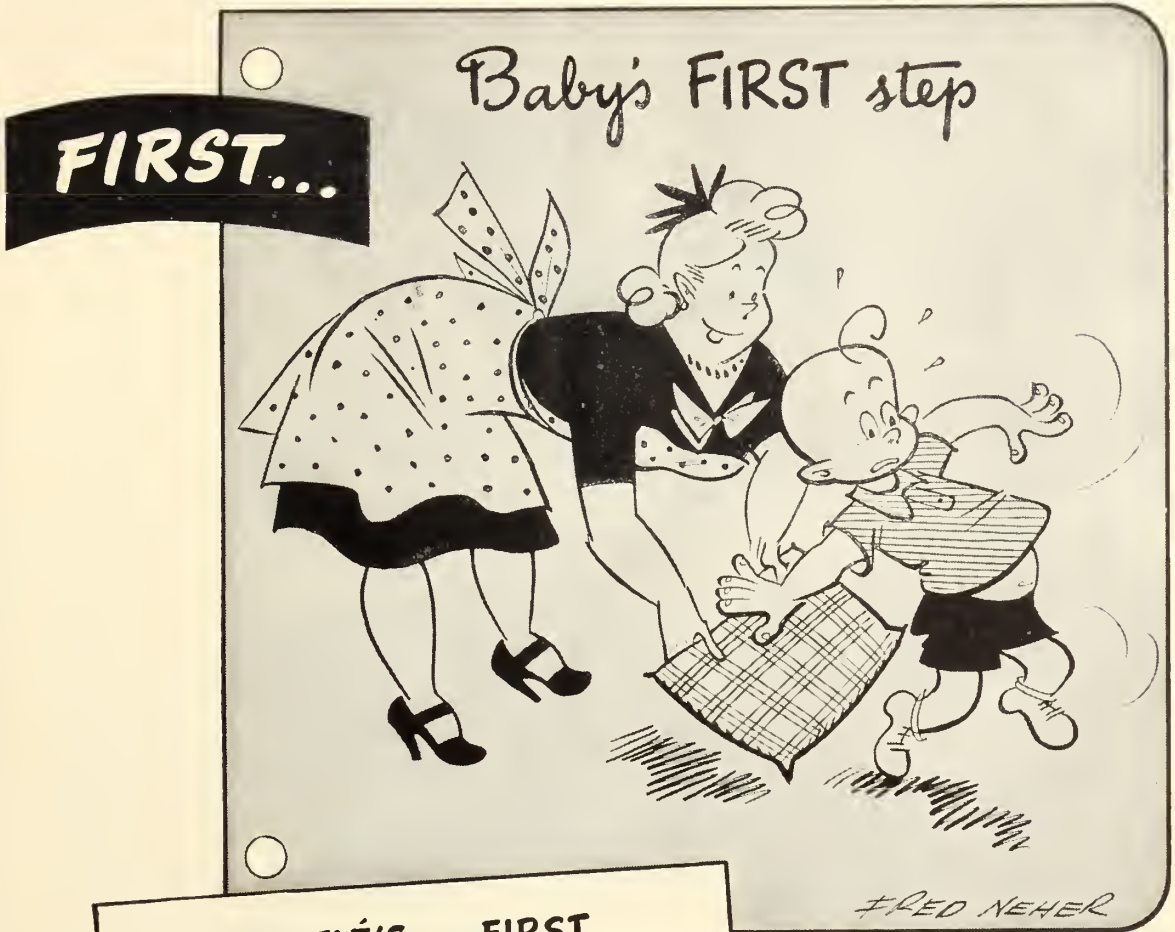
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EARLY VITAMIN DEFICIENCY STILL POSES PROBLEM TO MEDICAL SCIENCE

(Continued from Page 18)

nosis. As an example, the author cites the similarity of the symptoms of neurasthenia or nervous exhaustion and early vitamin deficiency, both of which manifest fatigue, insomnia, nervousness, headache, depression, muscle weakness, backache and lassitude.

In conclusion, the author says: "Primary deficiency states can be avoided by the proper selection of foods in the daily diet. Low economic status or reduction in the total food intake to provide for shipment abroad need not reduce the qualitative value of the diet. An adequate diet is still obtainable in this country, even for families of low income, and in spite of reduction in the total intake to provide for shipment of food abroad."

Four doctors report in the same issue of *The Journal* the results of severe deficiency disease seen mostly in white and half-breed Costa Rican children who subsisted

on a diet consisting chiefly of bananas and molasses.

The doctors—Antonio Peña Chavarría, C. Saénz-Herrera and E. Cordero-Carvajal from the Department of Pediatrics of the San Juan de Dios Hospital, San José, and Leon Goldman from the Department of Dermatology and Syphilology of the College of Medicine of the University of Cincinnati—noted changes in the children's hair from slight graying to intense whiteness. The hair "becomes loosened and is easily pulled out of the scalp," they say.

This condition, the authors believe, is caused by a deficiency of one of the less well known members of the vitamin B complex group. The children can be treated successfully if they survive the severe vitamin deficiency state. Improvement can be produced by a general, adequate diet or with a mixture of vitamin B complex.

The addition of biotin, one of the most potent known members of the vitamin B complex, "is thought, but not proved," to accelerate the return of both the pigmentation and growth of the hair, according to the authors.

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HARTMAN (Annals of Allergy, Nov.-Dec. 1945), "Complete or very marked relief of the headache and associated symptoms were obtained within eighty minutes in seventeen (85%) of the twenty cases."

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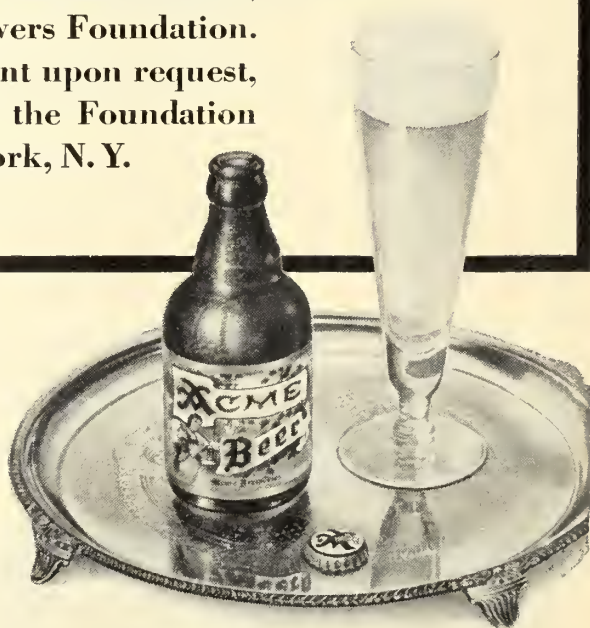
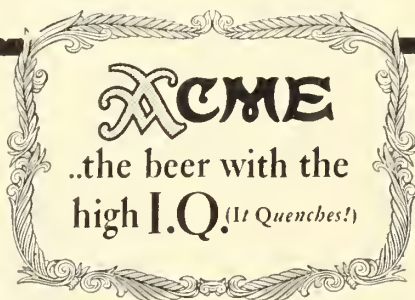
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Lennox, W. G. (1945), *Petit Mal Epilepsies: Their Treatment with Tridione*, J. Amer. Med. Assn., 129:1069, December 15.

DeJong, R. N. (1946), *Effect of Tridione in the Control of Psychomotor Attacks*, J. Amer. Med. Assn., 130:565, March 2.

Thorne, Frederick C. (1945), *The Anticonvulsant Action of Tridione*, Psychiatric Quarterly, October.

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Brucellosis, also known as undulant fever, is a difficult disease to diagnose because psychoneurosis may mask the original symptoms, according to Harold J. Harris, M.D., of New York.

Writing in the August 31 issue of *The Journal of the American Medical Association*, Dr. Harris points out that "it is almost as easy to mistake psychoneurosis for brucellosis as it has been to commit the opposite error in the past, i.e., to diagnose actual brucellosis as psychoneurosis. The subjective complaints are likely to be very similar in the chronic illness."

Psychoneurosis usually develops because the disease is characterized by marked invalidism and slow convalescence.

The difficulty of diagnosing this infection is further illustrated by the fact that the disease does not show characteristic symptoms and therefore when the patient has persistent fever, sweating and complains of great fatigue and joint or muscle pains, there is reason to suspect the presence of an infectious disease such as typhoid or malaria.

Cows, hogs and goats harbor the *Brucella* bacteria and man contracts the infection by drinking raw milk or handling infectious material. The disease rate among veterinarians in Iowa, according to an investigator cited by the author, was 250 annually per 100,000 between 1942 and 1945. The only higher rate was among packing house workers, who had a rate of 271.5 per 100,000. By way of comparison, the rate for farm workers is 43 per 100,000 and for urban groups of merchant and professional men 3.3 per 100,000.

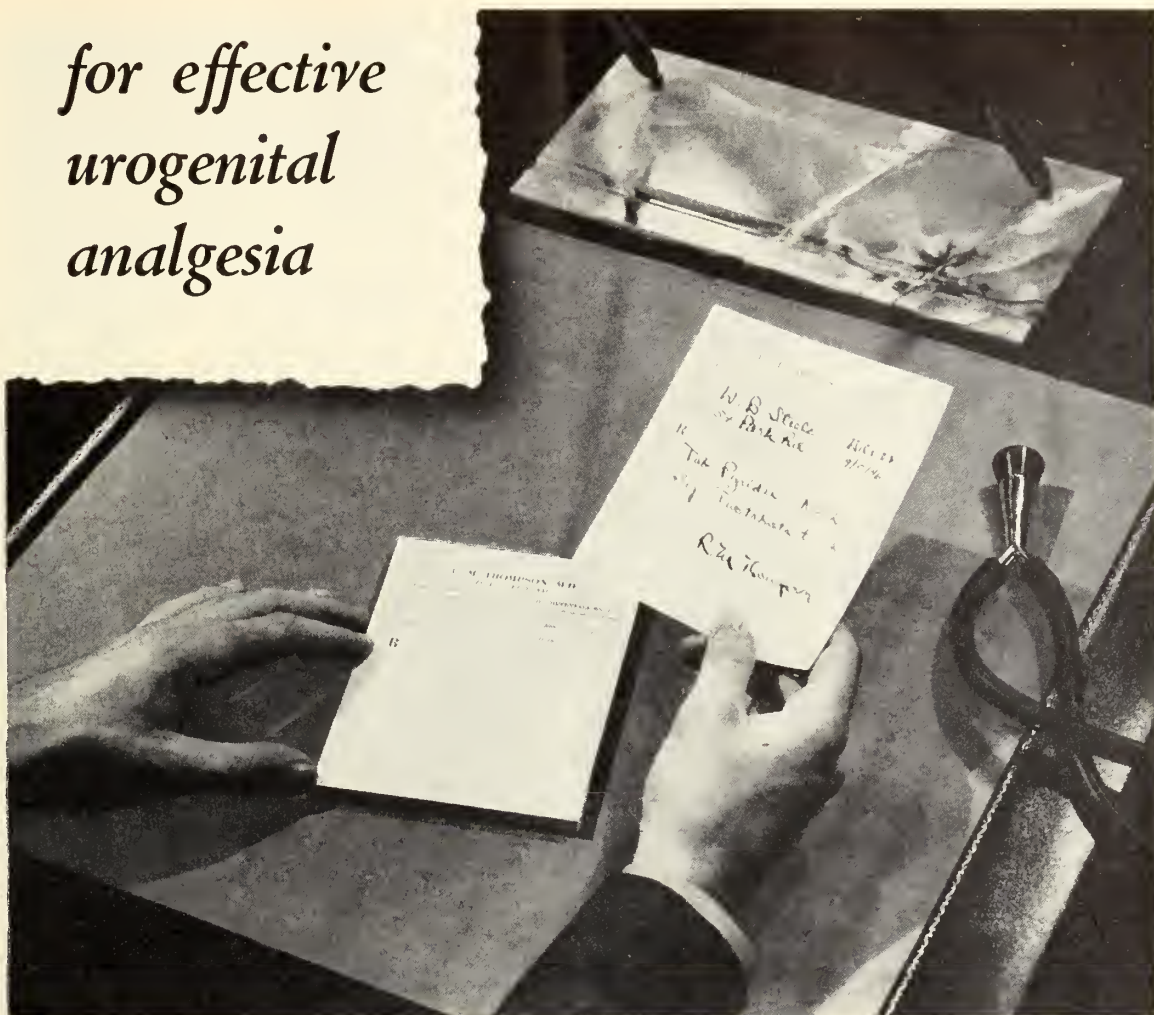
The author emphasizes the importance of early diagnosis, especially in animals, stating that "failure of early diagnosis in man is of less importance to his fellow man than such failure in the animal kingdom. As far as is known, human beings do not directly transmit infection to other human beings, nor do they serve as reservoirs of infection for the indirect transmission of infection. The undiagnosed infection in the animal is almost limitless in its potential danger to other animals, and thence to man."

Dr. Harris states that the "treatment of brucellosis is likely to be a tedious, arduous task for both the physician and patient but is usually successful in bringing about recovery if not permanent cure." He maintains that "five years of freedom from all manifestations of illness probably should be the minimum period which must elapse before even the reasonable hope of cure should be entertained. Reports on cures after six months or less of observation, which are so frequently seen in the literature, are often responsible for the perpetuation of many useless ideas about treatment."

In evaluating several treatment procedures the author contends that neither penicillin nor the sulfonamides give promise of being curative while streptomycin is only effective in terminating the acute illness. However, a relapse usually follows the use of this drug. A vaccine serves as the most effective treatment to date for the uncomplicated chronic infection.

Jakob Henle (1809-1885).—The science of modern bacteriology may be said to have begun with the essay of Jakob Henle on "Miasms and Contagia," published in his "Pathologische Untersuchung" in 1840. His theory was a deduction of the speculative observations of earlier observers rather than of personal experimentation. Neither did the methods of his day provide him with an opportunity to prove his conjectures. However, in his work undoubtedly appears the first clear statement on the idea of the contagium animatum.—Warner's *Calendar of Medical History*.

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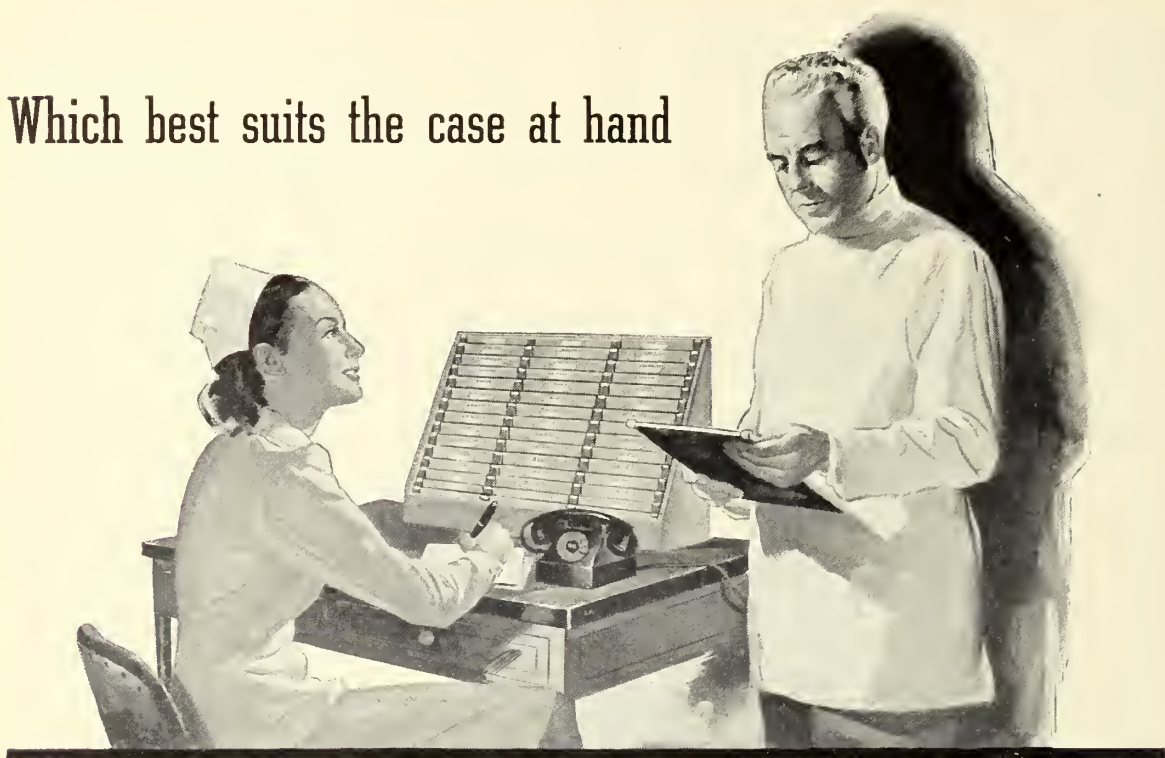
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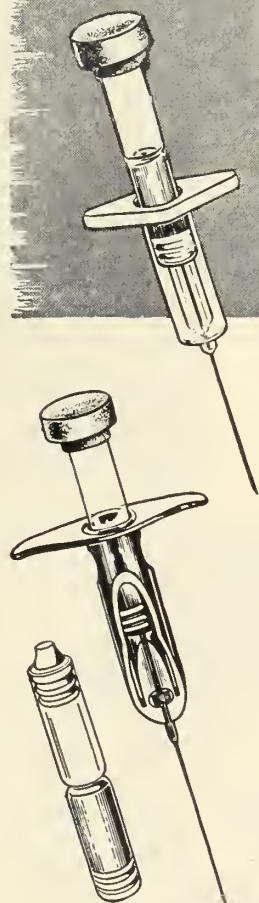
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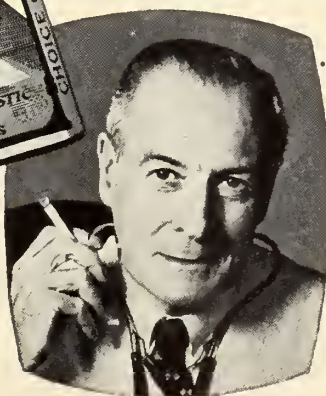
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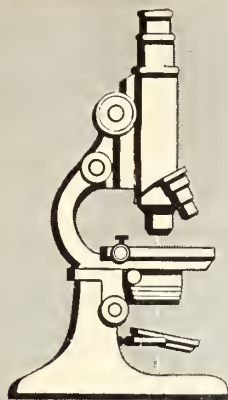
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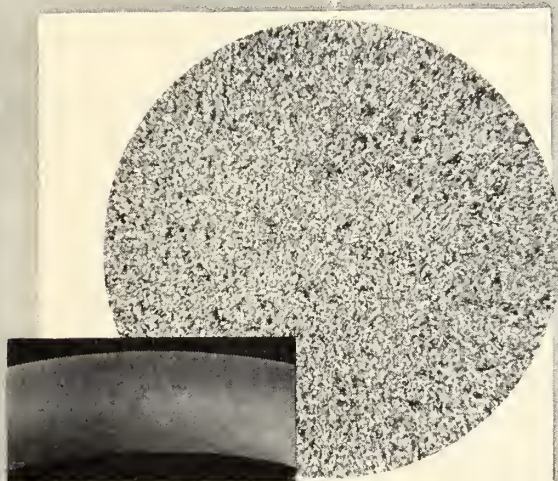
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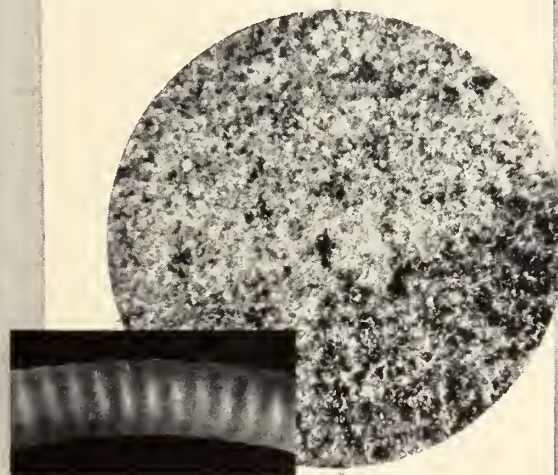
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